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CEREBRAL SYPHILIS.

A CLINICAL ANALYSIS OF TWENTY-SIX CASES—SEVEN WITH
AUTOPSY.

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INTRODUCTION.

Syphilis is a subject which has always occupied an important place in medicine, but it is only comparatively recently that our knowledge concerning it has been much increased. Metchnikoff and Roux, Neisser, and others have now succeeded in transmitting syphilis to apes; Schaudinn and Hoffman have discovered the *spirochæte pallida*; Wassermann, Neisser, and Brück have

elaborated a bio-chemical reaction which is of the greatest practical importance in diagnosing syphilitic affections; and during the last year Noguchi has succeeded in obtaining a pure culture of the *spirochæte pallida*. Such a brilliant series of results leads us to the hope that the near future will increase our knowledge still further.*

Syphilis shows itself in all manner of forms and attacks every kind of tissue, but in this communication I intend only to deal with it as it affects the nervous system, and more especially as a factor in the causation of mental disease. The topic is one which is of extreme importance to the state, and of great interest to the physician. It is important to the state owing to the fact that recent studies with the Wassermann reaction have made it plain that syphilis is probably one of the most potent factors in the production of all degrees of congenital feeble-mindedness, and by most physicians it is recognized as the sole cause of general paralysis, locomotor ataxia, cerebro-spinal syphilis, and as a contributory factor in the development of many other organic conditions. If one just considers for a moment what a large percentage of the inmates of our asylums, almshouses, and feeble-minded institutions are syphilitic as a result either of acquired or of hereditary syphilitic disease, one may form some estimate of the cost to the state for the upkeep of these hopeless victims. To the physician the disease as it affects the nervous system is a most fascinating one, owing to the protean nature and elusiveness of its manifestations.

Syphilis of the nervous system is a relatively frequent disease as, according to Dana, from 5 to 10 per cent of all those affected by syphilis develop an affection of the nervous system. Other observers put the average at from $1\frac{1}{2}$ to 3 per cent. Mott asserts, however, that owing to the increased strain of living and owing to the conversion of a rural into an urban population, syphilitic affections of the nervous system are greatly on the increase. Why the nervous system is affected in some individuals and not in others is a question which at the present time cannot be answered.

* Since this paper was written, Noguchi and Moore in the *Journal of Experimental Medicine* for February, 1913, have reported the demonstration of the *spirochæte pallida* in the brain cortex of 12 out of 70 cases of general paralysis which they have examined.

Is it due to a very highly susceptible nervous system, or to a specially virulent type of organism? Mott quotes as the most striking example of its being a special neurotoxic virus the cases reported by Brosius of seven glass-blowers, each of whom had a chancre of the lip; ten years later five of them again came under observation, and it was found that four of them had developed either tabes or general paralysis.

It must be clearly understood that not necessarily everyone who has a syphilitic involvement of the nervous system shows mental symptoms, but I don't think I am rash when I say that probably about one-half of them do develop a psychosis which has many characteristic features. The rôle of cerebral syphilis as a cause of mental disease has, however, never been quite fully realized, and a glance through the literature is sufficient to show how scarce the systematic and detailed presentations of the subject really are. This neglect seems to me to be partly due to the fact that until a few years ago cases of mental disorder were studied almost entirely from a symptomatic point of view, any excitement being designated mania, any depression melancholia, while it was considered more or less waste of time to attempt to analyze the individual symptoms, and thus find out the main cause of the mental disorder. Even the most modern text-books on mental diseases deal quite inadequately with this subject, and give us no idea of its importance or frequency. Such a state of affairs is all the more to be wondered at because, of all organic affections of the nervous system, syphilis is, by far, the one most amenable to treatment. My object in presenting this thesis is to try to prove that cerebral syphilis has a definite place in the organic psychoses, that there are certain symptoms and signs in cerebral syphilis which, when taken together, make up a symptom-complex which is characteristic of cerebral syphilis, and which allow us to differentiate cerebral syphilis from any other affection. It is true that in cerebral syphilis, as in other disease entities, *e. g.*, general paralysis, dementia præcox, etc., there are a certain number of cases that may be considered atypical, but a disease entity is formed by a majority of cases, and I would therefore state positively at the outset that the vast majority of cases of cerebral syphilis do show a characteristic symptomatology which allows us to diagnose these cases from cases of general paralysis, arteriosclerotic brain disease and other conditions.

This thesis is based essentially on the study of 26 cases, seven with autopsy, which I have personally observed. 24 of these cases were studied in the clinical service of the Psychiatric Institute, Wards Island, New York, and the remaining two at the Royal Edinburgh Asylum, Morningside. In addition to these personally observed cases I have had the opportunity of examining the case-records of 27 other cases of cerebral syphilis, all of which came to autopsy, from various of the New York State hospitals.

CAUSATION.

Since Schaudinn and Hoffman discovered the spirochæte pallida it has been generally accepted as the specific causal organism of syphilis, and has been demonstrated by a host of different workers in chancres, mucous tubercles and papules. In addition to having been found in the primary lesion, spirochætes have been found in infected glands far removed from the primary lesion, in the liver, spleen, and pia arachnoid of children with congenital lues, in syphilitic plaques in the aorta, and in practically every kind of syphilitic lesion.

Mott quotes Hoffman as showing that the cerebro-spinal fluid may be infective, as Hoffman successfully inoculated a monkey with the cerebro-spinal fluid obtained blood-free from a man suffering with a papular syphilide. Dohio and Tanaka found spirochætes in the spinal fluid in the case of a patient with a papular eruption, but a second examination was unsuccessful.

Nichols and Hough have very recently reported the exceedingly interesting case of a man, 25 years of age, who contracted syphilis in September, 1911, received two injections of 0.6 gm. salvarsan, and was able to return to duty on December 24, 1911. In May, 1912, the characteristic mental symptoms and physical signs of a syphilitic involvement of the nervous system set in. The cerebro-spinal fluid was examined for spirochætes, but none could be demonstrated. It was decided, however, to inject 3 cc. of the untreated spinal fluid into each testicle of a full-grown rabbit. After a period of 57 days some clear ropy fluid was obtained from a resistant area which had developed in the body of the left testicle, and this fluid, when examined with a dark-field microscope, was found to be rich in active spirochætes of the

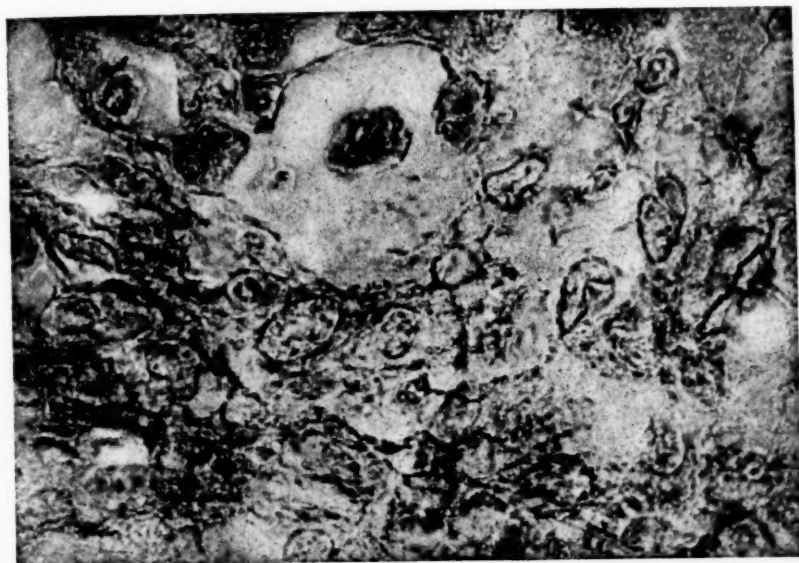


FIG. 2.

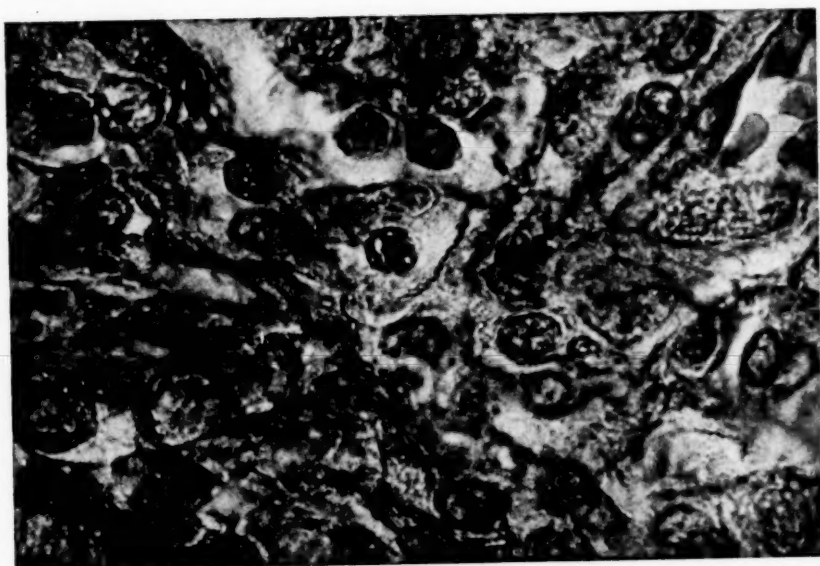


FIG. 1.

pallida type. 24 days later the testicle was excised, and sections stained by the Levaditi method showed immense numbers of spirochætes. These spirochætes have now been transmitted to a second generation, and the incubation period was found to have dropped from 50 to 12 days.

The other testicle, up until date, has been unaffected. Nichols and Hough quote Babes and Panea, Gaucher and Merle, Rach, Sézary and Paillard, as others who have been successful in finding spirochætes in the cerebro-spinal fluid.

In the tertiary stages of syphilis, however, the spirochæte has been exceedingly difficult to demonstrate, and has been found in small numbers practically only in gummata. The explanation of their absence in tertiary lesions is probably due to the fact that tertiary lesions are as a general rule non-infective, and furthermore the organism may be in a latent or attenuated form. Strassmann, however, in 1910, reported a case in which, for the first time, spirochætes were demonstrated in the central nervous system of an adult with acquired syphilis. The patient had first shown nervous symptoms 8 or 9 months after infection, and died after an illness which lasted for 18 months. The pathological diagnosis was meningo-myelitis, meningo-encephalitis, and Heubner's endarteritis of the great and middle-sized vessels. In the brain, spinal cord, meninges, and blood-vessels large numbers of the spirochætes of Schaudinn were found.

I am fortunate enough to be able to report a second case in which the spirochæte pallida has been found in the central nervous system (figs. 1 and 2).

The patient was a married man, 47 years of age, who was admitted to the clinical service of the Psychiatric Institute on January 19, 1910. He had contracted syphilis in August, 1909—just five months previous to admission—was treated by a quack for two months, and then consulted a Dr. Logan for a severe vesiculo-pustular eruption, mucous patches, enlarged glands, and a serous discharge. Dr. Logan treated him with:

R Hydrarg. biniodid gr. 1/16th.

Pot Iodid. gr. x.

Sig. T. I. D.

In addition he is said to have received mercurial inunctions twice daily. He improved for a time, but about three weeks previous to admission, even in spite of treatment, he started to complain of severe pain in the back of his head and neck, became forgetful, spoke thickly, and on January

7 had a series of six convulsive seizures with loss of consciousness, but without any residual paralysis. During his hospital residence he had a dull, confused, untidy appearance, did not appear to realize or take any interest in his surroundings, but when roused co-operated fairly well in the mental examination. He was slightly euphoric, said that he was happy, but did not express any grandiose or peculiar ideas. No hallucinations could be elicited. He had a poor realization of time and place, stated that he had been admitted to the hospital on a Sunday or Monday (Wednesday), that he had travelled all the way in a carriage (really in a boat), and that he had been in the hospital for three days (when he had only been for one). He was able to mention the main facts of his life correctly, but was quite unable to correlate dates. He made mistakes in doing the simplest calculations, had forgotten all the three retention tests after a period of three minutes, but yet did not realize that his mind was disordered, and said that he thought he was capable of working.

Physically: He had a scar on his penis, and old syphilitic scars on his body. He presented slight residuals of a right-sided hemiplegia; *e. g.*, tongue protruded to the right, and right arm and leg slightly weaker than those on the left side. His tendon reflexes were equally exaggerated on the two sides; there was no sign of Babinski. He had a ptosis of both upper eyelids, pupils reacted promptly both to light and on accommodation, speech and writing showed confusion, but no special distortion. There was tremor of tongue, facial muscles, and hands.

The examination of the cerebro-spinal fluid showed 250 cells per cmm., positive globulin tests, and a positive Wassermann reaction both with the blood-serum and with the cerebro-spinal fluid.

His condition remained unchanged until the time of his death, ten days after admission.

The autopsy showed a syphilitic basal meningitis with miliary gummata, an acute softening in the left caudate nucleus, and a moderate degree of endarteritis.

A portion of the brain was sent to Professor James Ewing, Cornell University, who was able to demonstrate spirochaetes in a diffuse syphilitic process in the region of the left Sylvian fossa.

The case seems to me to be an extremely important one, therefore, on account of the fact that it developed such a short time after the initial infection even in spite of vigorous anti-syphilitic treatment, on account of its rapid course, and also on account of the fact that this is only the second time that spirochaetes have been found in the central nervous system.

HISTORY OF INFECTION.

In many well-marked cases of syphilitic disease of the nervous system it is often extremely difficult to obtain a history of the

primary infection. It is consequently extremely interesting to remember that in 1865 a medical commission appointed by the Admiralty to investigate the whole question of venereal disease gave it as their opinion that sores, both soft and hard, may be followed by every variety of syphilitic eruption. Mott has also stated decisively that in his opinion soft sores are often syphilitic in nature. Such statements render it imperative for all venereal sores to be examined for the spirochæte pallida, so as to be able to definitely rule out syphilitic infection.

Gowers, in his Lettsomian lectures, has stated that Radcliffe Croker collected 56 cases of tertiary syphilitic skin eruption and in 11 of these no history could be obtained of the occurrence of a primary chancre. Such being the case, it is not to be wondered at that not infrequently one comes across cases with syphilitic involvement of the nervous system from whom it is impossible to get a history of primary infection. The question then naturally arises whether the nervous system is more likely to be affected after mild forms of the primary infection—so mild that the primary sore and secondary symptoms are entirely overlooked—or after the severer forms. It seems to me that it is in the mild cases that treatment is either neglected altogether, or else very imperfectly carried out, and it is therefore only logical to suppose that those are the cases which will be most likely to show some further progress of the disease either in the way of gummata, involvement of the internal organs, or nervous system.

A case that well illustrates the points just mentioned is the following:

A married man, 33 years old, was admitted to the clinical service of the Psychiatric Institute on December 28, 1909, presenting unmistakable signs, both physical and mental, of an acute syphilitic involvement of the nervous system. He himself and his wife were repeatedly questioned in regard to syphilitic infection, but both absolutely denied any knowledge of it. A letter from a doctor who had seen the patient outside, however, stated that on July 31, 1908, the patient was suffering from mucous patches and condylomata, and five months later had a transitory right-sided hemiplegia, which rapidly cleared up under large doses of potassium iodide.

In three of my cases all history of venereal infection was denied; in three no definite information could be obtained, owing to the mental condition of the patient; one denied syphilis but gave a history of gonorrhœa.

RE-INFECTION.

Another question in regard to the etiology of syphilitic conditions is the question of re-infection. Mott seems to hold the view that a person, after having once acquired syphilis, obtains an immunity and cannot be re-infected. McDonagh, on the other hand, states that there is no evidence to show that there is such a thing as syphilitic immunity either to one's own original or to a foreign virus, and gives as his reason why so few cases of re-infection are seen the fact that so few cases are really cured; *i. e.*, they are syphilitic, and so cannot be re-infected.

The following case supports McDonagh's view and furnishes good evidence that re-infection is quite possible:

An unmarried man, 42 years old, on January 18, 1910, was admitted to the clinical service of the Psychiatric Institute in an excited, elated, but somewhat confused state. His memory for recent events was very poor, and from time to time he reacted to auditory hallucinations.

Physically: He complained of severe frontal headache. His optic discs showed a slight degree of neuritis. His pupils were equal, regular, and reacted promptly to light and on accommodation. His speech was unimpaired, but in writing, letters were occasionally omitted. The tendon reflexes were equally exaggerated on the two sides.

Under anti-syphilitic treatment with mercurial inunctions a rapid improvement occurred, and by March 15, he had completely recovered.

The point which I wish to emphasize about the case is the fact that after his recovery he gave a history of a syphilitic chancre which he had acquired in 1894. At that time he was in Berlin, and was treated by Professor Lassar for 13 weeks with bi-weekly injections of quicksilver.

A letter obtained from his doctor in New York states that he saw the patient about March, 1909, ten months before the development of mental symptoms, and that at that time the patient had an extensive rash over his body and mucous patches on his mouth and throat, which disappeared under treatment with bichloride of mercury and potassium iodide. He then neglected treatment, and the further symptoms ensued.

There seems then from the above statements to be little reasonable doubt in regard to this patient's double infection.

IMPORTANCE OF OTHER FACTORS AS CAUSATIVE AGENTS.

Although a syphilitic infection is a *sine qua non* in the causation of tertiary lesions, various other etiological factors are frequently met with which may act as contributory factors, *e. g.*, alcoholic excess, physical or mental strain, and trauma. Some of

the older writers, for instance, used to speak about cases of "traumatic general paralysis," but we now realize that in such cases the trauma simply helped to light up the underlying syphilitic process. That these contributory factors may, however, seriously complicate a case and render the diagnosis extremely difficult is very well instanced by the following case:

A bartender, 50 years of age, married, was admitted to the clinical service of the Psychiatric Institute on October 2, 1909. He had had syphilis at a date which could not be definitely specified, and had also been excessively alcoholic. Two years previous to admission he was hit on the left side of the head with a sledge-hammer and was rendered unconscious for a short period of time. Shortly after this a change was noticed in his disposition; he became forgetful, complained of severe headaches, and lost interest in things. Three months previous to admission he had a transitory diplopia, dragged his feet when walking, became delirious, imagined he was fishing, and acted at times as though he was picking insects off his wife.

On admission he was in a dull, complacent, mildly euphoric state, and took little interest in his surroundings. He answered questions promptly but made many contradictory statements and fabricated somewhat, saying that he had been in the hospital for six months (two days). He admitted having heard voices calling him names. He was disoriented for time and place, said that the month was August (October), and that the place was Staten Island (Wards Island). In giving an account of his life he made numerous contradictory and inconsistent statements, and discrepancies occurred in his dates. His power of retention was rather poor, and in carrying out simple calculations several mistakes were made. He denied that his mind was in any way disordered, did not admit feeling confused, and said that his memory was good.

Physically: His sense of smell was defective on both sides; the pupils were unequal, irregular, and reacted with small excursion both to light and on accommodation; the left side of the face was slightly flattened, but no difference could be made out between the two sides on movement; no speech defect; writing showed omission and transposition of letters. There was general muscular wasting of arms and legs; hand grips were weak, about equal; extensor power of the feet was diminished, especially on the left side; the gait was unsteady, and Romberg's sign was slightly present; tenderness was elicited on deep pressure of the leg muscles; the left knee-jerk was diminished, the right was normal. The examination of the cerebro-spinal fluid showed a marked pleocytosis.

During his hospital residence he continued to maintain the same dull, drowsy, complacent attitude, and died 20 days after admission.

From the clinical point of view, the case was one which presented numerous difficulties, as the three etiological factors—syphilis, alcohol, and trauma—each seemed to have played a part

in the development of the psychosis. The head trauma was no doubt the exciting factor in the case, as following it there was a definite change in the patient's disposition. Whether or not the head trauma had made him more susceptible to alcohol is impossible to say, but the polyneuritic features were prominent in the case, and, associated with the mental picture of confusion and fabrications, reminded one very much of a case of Korsakow's type of alcoholic psychosis.

From the history of transitory diplopia, the fact that his pupils reacted with limited excursion to light, that his writing was defective, and that he had a marked pleocytosis of the cerebro-spinal fluid, the picture was thought to be complicated by a syphilitic or parasymphilitic affection of the nervous system.

The autopsy showed a well-marked syphilitic meningitis and endarteritis (Heubner's type).

TIME OF ONSET OF NERVOUS SYMPTOMS.

Fournier and Heubner used to hold that it was exceedingly unusual for nervous symptoms to develop within the first year after syphilitic infection, but present-day statistics prove them to have been wrong.

Naunyn, for instance, has stated that out of 325 cases, 70 with autopsy, syphilitic disease of the nervous system appears most frequently during the first year after infection, that this frequency decreases from year to year, and that cases of cerebral syphilis rarely occur more than ten years after primary infection. In 22 cases reported by Erb, in which the date of primary infection could be definitely determined, 59 per cent appeared during the first three years, and 82 per cent during the first six years, after infection. Mott quotes Kahler as describing a case which occurred while the primary sore was still unhealed, and has himself reported a case of syphilitic basal meningitis which developed ten weeks after infection. He has also reported other cases which have developed four months after infection.

Nonne and Oppenheim each describe cases which have occurred within three to four months after the primary infection. Kinnier in 1888 described the case of a woman, 35 years of age, who was in a delirious mental state, had convulsive seizures, and at the

same time had typical mucous plaques, enlargement of glands, a specific rash over her body, ulcers on her hips, and typical bullous syphilodermata.

Barrett has described the extremely interesting case of a man, 41 years of age, who in June, 1902, had a syphilitic infection. He was treated with mercury, and had occasional weeks of mixed treatment. In November, 1902, he was described as having severe headaches, was forgetful, dirty in his habits, "too stupid to eat." In December, 1902, he had a maculopapular rash, mucous patches, and enlarged glands. Later he relapsed into a stuporous state and showed cranial nerve palsies. The autopsy showed what Barrett calls a disseminated syphilitic encephalitis. Head, Gaucher and Maloizel, Dutheil, Gowers, Harkness, Neu, Ogilvie, and many others have all described cases occurring within a few months after primary infection.

In 17 of my cases of cerebral syphilis in which I have been able to get an accurate history of the date of infection and the onset of the nervous symptoms, the average interval elapsing has been six years, the shortest period being five months and the longest 22 years. In this case which occurred 22 years after infection, the diagnosis of cerebral syphilis was confirmed by autopsy.

From the above statistics, then, one can say with confidence that the majority of cases of cerebral syphilis do occur within the first ten years after primary infection. Some cases undoubtedly may and do develop later, but they are relatively few in number.

In general paralysis, on the other hand, it is exceedingly rare to have cases developing during the first ten years after syphilitic infection. In 45 cases of general paralysis in which I was able to get an accurate account of the date of syphilitic infection, and the onset of the general paralysis, the average interval elapsing before the onset of mental symptoms was 15 years.

MORBID ANATOMY.

Anatomically, three main types of cerebral syphilis have been differentiated: meningitis, endarteritis and gumma; but in each individual case there may be a combination of two or all of these elements. The endarteritic type is further subdivided into two

forms: (1) syphilitic endarteritis of the large cerebral blood-vessels, as described by Heubner in his classical monograph in 1874; (2) the small or terminal vessel form of endarteritis, described especially by Nissl and Alzheimer. This latter form is much less well-known than that described by Heubner, but a number of cases are now on record, some of which will be considered later in discussing the symptomatology.

It is principally due to the splendid histo-pathological work of Nissl and Alzheimer that we are now in a position to recognize the different forms of cerebral syphilis postmortem, and with almost absolute certainty differentiate them from cases of either general paralysis or arterio-sclerotic brain disease. Just as, however, one occasionally meets clinically with long-standing cases of cerebral syphilis showing a diffuse intelligence defect of which it is well-nigh impossible to say whether it is an acute syphilitic, or a general paralytic disorder, so also at autopsy cases do occur in which the most expert histo-pathologists hesitate to make a definite diagnosis.

I do not intend to discuss in detail the histological changes met with in cases of cerebral syphilis, as they have already been most fully and accurately described by Nissl, Alzheimer, Mott, Nonne, Dunlap, and a number of others; but a word may be said in regard to those cases of late cerebral syphilis of the meningo-encephalitic form, which are frequently so difficult to differentiate from cases of general paralysis. Dunlap has stated that these two usually distinct processes (cerebral syphilis and general paralysis) can come so closely together that no one can be too positive about which is actually present. The point which Dunlap especially emphasizes is that "whatever is found in the cortex of cerebral syphilis can be fairly definitely shown to be an extension of the process from the pia inward"; general paralysis, on the other hand, is essentially a disease of the cortex.

Other cases are sometimes met with at autopsy in which it is extremely difficult to say whether the vascular changes are of the nature of a syphilitic endarteritis or of arterio-sclerotic brain disease. This difficulty was particularly emphasized by Gowers in his Lettsomian Lectures when he said: "As generally met with, the disease is recent, and consists in a thickening of the wall, which is more limited than in atheroma, and less opaque.

But when such a disease has been treated, as by a course of iodide of potassium, the thickening is less and the opacity greater, so that the condition resembles more closely ordinary atheroma, for which it may usually be mistaken." When such a condition of affairs exists, one can obtain great help in coming to a diagnosis by considering the clinical picture as a whole, paying special attention to the age of the individual, the history of syphilitic infection, and the character and rapidity of onset of the mental and physical signs.

In addition to such cases as the above, other cases occur in which plainly there is a combination of an acute syphilitic with a general paralytic process. Many such cases have been reported in the literature, and an excellent example which has occurred in my own experience is the following:

A man, 38 years old, ten months after syphilitic infection developed a right-sided hemiplegia, from which he made a good recovery. He was again able to take up his employment, and worked efficiently for a period of five years. He then came under observation at the Psychiatric Institute for a depression, from which he made, in the course of a few weeks, what seemed a complete recovery. At this time he showed residuals of his right-sided hemiplegia, *e. g.*, right face flattened, weakness of right arm and leg, hemiplegic gait, tendon reflexes more exaggerated on the right side, and continuous ankle-clonus on the right side. There was no sign of Babinski, no hemianopia, no disorder of sensibility, and no tremor of the facial muscles. His sense of smell was defective on both sides. His pupils were unequal, right larger than left, both irregular; the right reacted sluggishly to light; the left reacted promptly; both reacted well on accommodation. There was no disorder of speech or writing. The examination of the cerebro-spinal fluid showed from 15 to 30 cells with a No. 3 eyepiece and 1/12 lens. Unfortunately, at this time no Wassermann examination was made. Two months after leaving the hospital he had a convulsive seizure, was unconscious for two days, and is said later to have expressed some grandiose ideas. About one month later, when re-admitted to the Psychiatric Institute, he behaved in such a strange, excitable manner that at first it was thought that he might be malingering. He denied that he had ever been in the hospital before, denied knowing the physician's name, said that he thought that the physician was in the hardware business, and called the charge-attendant "Antony." Later he lapsed into a quiet apathetic state, and showed especially a very striking defect in his power of retention; *e. g.*, *one day after being examined by ten different physicians he had no recollection of having been examined at all.* At no time did he express any grandiose ideas. His physical condition remained as noted above, but a second examination of his cerebro-spinal fluid showed ten cells per cmm., positive globulin tests, and a positive Wassermann re-

action, both with his blood-serum and with his cerebro-spinal fluid. He died one year after admission, following a series of three general convulsions.

The autopsy showed, in addition to a syphilitic meningitis and endarteritis, a focal general paralytic process affecting the left temporal, supra-marginal, and angular gyri regions.

The case is one of extreme interest, and emphasizes in a very special manner the difficulties frequently encountered in differential diagnosis. Here we had a man who, ten months after syphilitic infection, developed a right-sided hemiplegia from which he recovered sufficiently to be able to take up work again. Five years later he had a depression unaccompanied by any intellectual impairment, and without any physical signs suggestive of general paralysis. A few months later, however, following convulsions, we have decidedly peculiar behavior and a mental condition of the nature of an acute organic reaction, *e. g.*, marked retention defect, complete disorientation for time, place and person, and a poor memory for recent events. The physical signs tended to support the view that the case was one of cerebral syphilis. It is now interesting to note that the positive Wassermann reaction, both with the blood-serum and with the cerebro-spinal fluid, was really the only point which indicated that the case might be one of general paralysis.

In such a case one can only speculate in a very vague way in regard to the time of onset of the general paralytic process. Was it simply an acute extension of the already existing syphilitic process, or had it been slowly progressive in nature? Without attempting to answer the question, one would say that the striking thing about the anatomical picture was that the areas of predilection for general paralysis were essentially free.

SYMPTOMATOLOGY.

In a disease exhibiting so many pathological types as cerebral syphilis it is only natural to suppose that the clinical signs and symptoms will be markedly erratic, will lack any uniformity, and will vary according to the predominating type. Some writers insist upon describing one set of symptoms for the meningitic type, another set for the gummatous type, and still another set for the endarteritic type. It seems to me to be utterly valueless

so to do, in the first place owing to the fact that practically in every case two or all the types are in combination, and secondly because the treatment is essentially the same in each case irrespective of the type.

The important thing is to try to recognize the disease in its earliest stage, and treat it promptly and systematically.

In considering the symptomatology I intend to take up the physical and mental symptoms separately and in some detail.

I. SOMATIC SIGNS.

Headache.—This is one of the commonest and earliest symptoms met with in cases of brain syphilis, and should be looked upon as a definite danger signal. It is of especial diagnostic value in those cases in which it is severe and persistent in character, and has developed a few weeks or months after the primary syphilitic infection. The great majority of my patients gave a history of having experienced severe headaches which were frequently described as stabbing or throbbing in character, and were localized usually to the frontal region. My experience, however, in regard to the nocturnal exacerbation of the syphilitic headache—which by some is held to be pathognomonic—has been different from that of most others, as I must admit that in my cases it has been rarely present. Although the pain is not necessarily nocturnal in character, it is rather striking to note that it is very frequently paroxysmal, that it may precede all other symptoms by months or years, and that it gives the patient a strained, anxious appearance. Patrick emphasizes the fact that headache is especially diagnostic of cerebral syphilis when “in sequence or association with other symptoms,” *e. g.*, severe headache preceding the onset of a hemiplegia, monoplegia, or cranial nerve palsy.

Sleeplessness as a direct result of headache is seldom absent.

Dizziness.—Just as the majority of patients complain of headache, they likewise complain very frequently of a feeling of dizziness or faintness without any definite loss of consciousness, but sometimes accompanied by a feeling of mental confusion. These attacks are probably due to cerebral vascular disorders, and accordingly are very much more common in the endarteritic type of cerebral syphilis than in the meningitic or gummatous forms.

Fournier has called this condition the "*habitual subvertiginous state*," and, according to Patrick, believes that it is practically confined to cerebral syphilis.

Vomiting.—Associated with a history of headache, dizziness and sleeplessness, it is not uncommon to get a history of vomiting, projectile in type, not in relation to meals, and not accompanied by a feeling of nausea; it is in fact the type of vomiting which is seen in cases of brain tumor.

Those symptoms which have been mentioned are what might be called the prodromal or danger-signal symptoms of a case of syphilis of the nervous system, and it is rare indeed not to get a history of one or all of them. They should immediately put one on one's guard and make one direct the further examination along fairly definite lines.

Anæmia.—In 1888 McCall Anderson, in his presidential address on "Syphilitic Affections of the Nervous System" before the medical section of the British Medical Association, made the following statement: "The syphilitic subject is very likely to have lost his healthy appearance, and to have a dirty, earthy, sallow complexion, which is all the more marked the longer the poison has remained unchecked in the system. This peculiar form of anæmia is not constantly present, but when pronounced it is very significant of syphilis to the skilled observer, especially if he knows the patient to have had a clear complexion in earlier years."

The above statement struck me as interesting because occasionally one does notice a peculiar "muddy" appearance in these patients which is different from that seen in health. One would hesitate, however, before accepting such a point as a diagnostic sign, or as being especially characteristic.

Polyuria and Polydipsia.—These two symptoms are stated by a number of observers to be frequently present in cases of cerebral syphilis, particularly in cases of basilar meningitis. Oppenheim is stated to have found them present in 11 to 12 out of 36 cases of syphilitic basilar meningitis. They were not prominent in any of my cases.

Temperature.—The temperature in cases of cerebral syphilis does not, as a general rule, differ markedly from the normal, and on this account the temperature is of some diagnostic value in differentiating cases of cerebral syphilis from cases of tubercular

or other infection of the meninges in which the temperature is usually considerably raised.

Strasmann, however, has reported two cases of uncomplicated cerebral syphilis in which the temperature was raised, and remained raised for a month; it is also well to bear in mind that during convulsive seizures the temperature, both in cases of cerebral syphilis and general paralysis, may rise considerably.

CRANIAL NERVE AFFECTIONS.

Smell.—In cases showing a mental disorder it is often found exceedingly difficult to test the sense of smell, owing to defective co-operation on account either of suspiciousness or of mental confusion; in nine of my cases I was unable to come to any satisfactory conclusion in regard to it. Out of the remaining 17 cases, however, I was able to demonstrate some disorder of the sense of smell in eight, *i. e.*, in 47 per cent. Although the attempt was always made to examine each nostril separately, it was sometimes found impossible to do so, so that the tests cannot be considered entirely satisfactory. Although, then, the statistics are small and the mode of examination not everything that could be desired, the results are interesting and show how important a careful examination of the smell-function might be.

Visual Apparatus.—Eye-symptoms of all kinds and degrees are among the earliest and most characteristic symptoms of brain syphilis. Not infrequently a blurring or dimness of vision, "seeing double," squint, drooping of an upper eyelid, etc., are the first symptoms spontaneously complained of by the patient, and these are often stated to have been transitory in nature. It is this peculiar "coming and going" of symptoms which is especially characteristic. It has been estimated that in the absence of traumatism upwards of 90 per cent of all cases of ocular palsy in adults are caused by brain syphilis, tabes, general paralysis and brain tumor; by far the most frequent causes are brain syphilis and tabes, and cases of tabes are as a general rule so characteristic that it is exceedingly seldom that they are liable to be confounded with cases of brain syphilis.

The whole question of eye-symptoms in nervous and mental diseases has recently been fully and exhaustively treated in the

second edition of Professor Bumke's monograph on the "Pupillenstörungen bei Geistes und Nervenkrankheiten."

Pupils.—In all my cases the pupils have been described as unequal or irregular in outline. This observation, however, is not of any special diagnostic value, as in the great majority of cases of general paralysis and tabes, and in a certain number of cases of arterio-sclerotic brain disease, senility, alcoholism, and toxic exhaustive states, this same condition of inequality and irregularity is present.

In a previous paper on "The Diagnosis of Cerebral Syphilis" I laid great weight on the extreme rarity of the Argyll-Robertson-phenomenon, as being a distinct help in differentiating cases of acute syphilitic brain disease from other organic affections of the nervous system. Since that time, although I have not been able to greatly increase my case material, I am now able to say that out of 26 cases of brain syphilis I have been able to demonstrate the presence of Argyll-Robertson pupils on only two occasions.

Siemerling, in an analysis of 1639 cases showing Argyll-Robertson pupils, found only 1 per cent to be due to syphilis of the nervous system. Mott has stated that, although the Argyll-Robertson pupil is a sign of syphilitic infection, it does not occur in true syphilitic brain disease. J. Michell Clarke, in an exceedingly interesting paper, considers that the Argyll-Robertson phenomenon has to be regarded as an example of "the selective action of a poison upon the central nervous system, inasmuch as a special group of neurones, having a definite and restricted function, is picked out and put out of action." It is pointed out that other parasymphilitic affections offer other examples of similar selective action, *e. g.*, the disease of certain fibers of the posterior roots in tabes. In cerebro-spinal syphilis such results are held to be conspicuously absent, as the paralyses there met with are due to gross lesions. In his series of 69 cases of cerebro-spinal syphilis, Argyll-Robertson pupils were present in only five cases.

Purves Stewart states that experimental evidence has shown that the ciliary ganglion is the peripheral motor nucleus controlling the sphincter pupillæ, and quotes Merina as reporting 28 cases of tabes and general paralysis, exhibiting the Argyll-Robertson pupil, in which this ganglion was found to be invariably degenerated. "In one of them, where the Argyll-Robertson phe-

nomenon was confined to one eye, the ciliary ganglion was degenerated on that side alone, the ganglion of the other side being normal."

In twelve cases of cerebral syphilis with autopsy reported by Matthews, the Argyll-Robertson phenomenon could not be demonstrated. Hunt has reported six cases of cerebral syphilis and has emphasized the fact that the Argyll-Robertson phenomenon was always absent.

For the sake of comparison it is interesting to consider the frequency of the *presence* of Argyll-Robertson pupils in general paralysis. Kornfeld and Bikeles found them present in 62 per cent of cases, Raecke in 58 per cent, Joffroy in 53 per cent, Siemerling in 60 per cent, Jolly in 52 per cent, and Westphal in 50 per cent (quoted by Bumke).

Out of a series of 54 cases of general paralysis examined by myself, 36, or 66.2 per cent, showed the Argyll-Robertson phenomenon. In tabes the percentage of Argyll-Robertson pupils is even higher than in general paralysis. These statistics prove very conclusively to my mind how very important in diagnosis the presence or absence of the Argyll-Robertson phenomenon really is in diagnosis. Bumke is inclined to belittle it somewhat as a diagnostic aid, and speaks of an internal ophthalmoplegia as peculiarly diagnostic of brain syphilis. Internal ophthalmoplegia is, however, a comparatively rare symptom at any time, and therefore its use as a practical diagnostic agent must be extremely limited.

Rose has recently reviewed the literature concerning the presence of the Argyll-Robertson pupil in non-syphilitic conditions, and found reports of its presence in some traumatic cases, alcoholism, one case of diabetes, one case of disseminated sclerosis, and some cases of syringomyelia.

Farquhar Buzzard, however, has reported that absence of the light reflex, unilateral or bilateral, as a solitary ocular symptom, might be a most important physical sign, not of syphilis or of parasyphilis, but of the locality of a cerebral lesion. Buzzard backs up the above statement by the report of two exceedingly interesting cases with autopsy.

First Case.—For several weeks previous to admission the patient had had severe paroxysmal headaches which later were associated with vomiting and slight double optic neuritis. Double sign of Babinski. The right

pupil did not react to light, the left reacted sluggishly; all the other oculomotor functions were normal. The autopsy showed a cyst the size of a hazel-nut lying in the third ventricle attached to the choroid plexus, adherent to the fornix and blocking the Foramen of Munro.

Second Case.—History of epileptoid spells for three years, and of headache and vomiting for ten months. She had an optic neuritis and slight hemi-paresis. Both pupils were completely inactive to light; there was no other form of ophthalmoplegia. The autopsy showed, in addition to a large frontal lobe tumor, a small cyst lying in the third ventricle attached to the choroid plexus, impinging on the superior colliculus and the posterior commissure.

From the above observations Buzzard believes that absence of the light reflex is a valuable sign of gross disease in the third ventricle or in structures immediately surrounding it, and that it not infrequently constitutes the first localizing evidence of that disease.

When not accounted for by optic atrophy, absence of the light reflex in cases where a brain tumor is suspected contradicts operation, because it nearly always signifies that the tumor is too deep for eradication. Buzzard's observations have been given at some length because they do not appear to be very generally known, and because if correct they merit attention.

Optic Nerve.—Ophthalmoscopic and perimetric examinations are imperative in every case of cerebral syphilis. By means of the perimetric examination one may be able to detect not only a concentric contraction of the visual fields, but also hemianopic disturbances which otherwise might not have been suspected.

Two of my cases showed a double optic neuritis, three showed a one-sided optic atrophy, and one showed a retinitis proliferans.

In regard to optic neuritis, it may be well to remark that "it is simply a sign of increased intracranial tension and occurs *par excellence* in cases of brain tumor. It may, however, occur in nephritis, in lead poisoning, in diabetes, and in severe anæmia, and these affections have always to be excluded before thinking of some intracranial affection."

The optic atrophy seen in cases of cerebral syphilis has usually followed a previous neuritis; primary optic atrophy practically always means tabes, or general paralysis, or disseminated sclerosis. Uhtoff, for instance, thinks it highly improbable that a pure, progressive, primary atrophy of the optic nerve can occur in cerebral

syphilis. The case which showed the double retinitis proliferans was as follows:

A sailor, 38 years old, in 1907 contracted a syphilitic infection, *e. g.*, hard chancre, skin rash, sore throat. He received treatment for a number of months. About one year later he started to suffer from intense headaches, and his eyesight started to fail. He was again treated with mercurial inunctions; his headaches disappeared, but no improvement occurred in his vision.

Two years later (in February, 1910) he was admitted to the clinical service of the Psychiatric Institute in a highly excited, irritable state, suffering from auditory hallucinations in which he heard people say that they were going to hypnotize him, syphilize him, and kill him. He denied ever having had any visual hallucinations, but sometimes from his conduct it appeared as if he really suffered from them. His memory and general intellectual functions were well preserved.

Apart from his eye-symptoms he exhibited no special neurological features.

The examination of his cerebro-spinal fluid showed a negative cell count of 5 cells per cmm., negative globulin tests, and a negative Wassermann reaction both with the blood serum and with the cerebro-spinal fluid.

The case is interesting, then, on account of its showing an acute hallucinatory disorder in a man who apparently had been cured of the syphilitic condition of his nervous system.

A number of my cases showed a homonymous hemianopic disturbance; but these, with one exception, were cases in which the hemianopic defect was associated with a hemiplegia, and will be considered later. The exceptional case is as follows:

A colored man, 38 years old, gave a history of having contracted syphilis in 1901, for which he received three years treatment. In 1908 he noticed that he could not see anything on the right-hand side of his field of vision, his memory started to fail, and he became depressed. Later his sense of smell became very defective, and on May 15, 1909, he had a stroke of paralysis, without loss of consciousness, affecting principally the left arm.

Mentally he presented a dull, depressed state, made many inconsistent statements, showed poor judgment, and had no true appreciation of his condition.

The patient died from lobar pneumonia on November 17, 1909, but unfortunately permission for an autopsy could not be obtained.

Third, Fourth and Sixth Nerves.—Of all the cranial nerves the third seems to be the one by far the most frequently affected in syphilis of the nervous system. Fournier, Knies, and others have stated that in 75 per cent of cases its partial or complete

paralysis is syphilitic in origin; but it is extremely rare to see a *complete* third-nerve palsy. In four of my cases the third nerve was partially affected; one case showed a bilateral ptosis; two cases showed a unilateral ptosis; one case showed an internal ophthalmoplegia, and in addition a paralysis of the inferior oblique muscle.

The fourth nerve was affected in the patient who had the internal ophthalmoplegia and the paralysis of the inferior oblique; in none of my other cases was the fourth nerve affected.

The sixth nerve was affected in only two of my cases.

Oppenheim, in a series of 100 cases observed clinically, found the third nerve affected 34 times; the sixth nerve was affected 16 times; the fourth nerve was affected five times (quoted by Mott).

Before leaving the consideration of the eye-symptoms, one might mention that nystagmus is sometimes seen in cases of cerebral syphilis, and along with the other symptoms is sometimes helpful in diagnosis.

Other Cranial Nerves.—Of the other cranial nerves the seventh nerve was affected in five, and the auditory nerve in four of my cases.

None of the other cranial nerves were affected except in association with a hemiplegic disorder.

Speech.—In the majority of cases of brain syphilis the speech remains intact. In some cases an aphasia disorder may be present, but this is usually in association with a right-sided hemiplegia. Occasionally one comes across a case in which the aphasia disorder has occurred independently of the hemiplegia, *e. g.* N. G. F., a right-handed man who had a left-sided hemiplegia and a motor aphasia. Aphasia disorders occur, however, quite frequently in cases of general paralysis of a focal nature, in cases of arteriosclerotic brain disease, and in other conditions, and therefore their presence is not of any special diagnostic value.

The point which I wish to emphasize is that in those cases of brain syphilis which do show a speech defect—those cases in which there is a hemiplegia—it is of the nature of a dysarthria, indistinct, monotonous, and absolutely different from the thick, slurring, distorted speech of the general paralytic.

Writing.—In some cases the writing may be used as a help in diagnosis; but it is by no means a safe guide, as so much depends upon the education or lack of education of the individual.

As a general rule, in cases of cerebral syphilis the writing usually remains intact; but in a number of my cases it showed defects similar to those seen in cases of general paralysis. Although it is by no means a safe guide, it is one which should never be omitted.

Tremor.—The tremors which one meets with in cases of cerebral syphilis may be of almost any variety, depending upon whether the anatomical condition is of a specially diffuse nature. Taken by itself, tremor in cases of cerebral syphilis is of no diagnostic value; but I think it is important to note—even although it is a negative fact—that the tremor of lips and facial muscles, which is such a common sign in cases of general paralysis, is conspicuously absent in most cases of cerebral syphilis. I do not mean to infer that facial tremor is never present in cases of cerebral syphilis. It is sometimes present as markedly as in general paralysis, but it is relatively very infrequent.

Convulsions.—It is a well-known fact that convulsions of any kind—if heart and kidney diseases are excluded—coming on in a man between 25 and 45 years of age, are most commonly the result of syphilitic involvement of the nervous system. Convulsive attacks are of course especially common in cases of endarteritis, but they are also by no means infrequent in cases of meningitis, particularly of the convexity, and in gummata. The convulsion may be very slight, may be simply limited to a special group of muscles, or it may be epileptoid or apoplectiform in nature. Gowers has stated that in cerebral syphilis the convulsive attacks frequently take place without loss of consciousness, and has reported that in one-tenth of 50 cases examined by him this was actually so. Other points that may be emphasized in connection with the fits of syphilitic brain disease are that they are usually focal in nature, and that they tend to leave permanent residuals. In general paralysis, on the other hand, the seizures are typically general in character, are usually accompanied by loss of consciousness, and frequently leave no residuals; cases of general paralysis with permanent focal symptoms, however, are by no means rare.

In 14 of my cases there was a definite hemiplegia or residuals of such; two cases showed a hemiplegia plus an aphasia disorder; one case showed a hemiplegia with hemianæsthesia and analgesia; and four cases showed a hemiplegia with hemianæsthesia and homonymous hemianopia. I regret that I cannot state definitely in how many of my cases the onset of the hemiplegia was unaccompanied by unconsciousness, owing to the fact that it is exceedingly difficult to get an accurate history along these lines.

In a great many instances it was the physical examination which was responsible for first bringing it to the notice of the patients that they were suffering from a weakness affecting one or other side.

At this point it might be well to take up the occurrence of pseudo-bulbar paralysis.

2. PSEUDO-BULBAR PARALYSIS.

Pseudo-bulbar paralysis is quite frequently met with in cases of cerebral syphilis, and out of my series of cases six have shown well-marked pseudo-bulbar symptoms. It may be described as a bilateral motor paralysis, the commonest cause of which is a bilateral softening or multiple small softenings in the region of the basal nuclei. The usual history is that the patient has had several hemiplegic attacks, at first implicating the same side; and then latterly the other side is affected, so that a bilateral spastic condition results. These patients speak in a thick, monotonous way, frequently have great difficulty in swallowing, coughing and blowing, and really show the same subjective symptoms as in true bulbar palsy, but are differentiated from true bulbar palsy by the absence of atrophy of the paralyzed parts, fibrillary tremors, and electrical changes.

Patients with pseudo-bulbar paralysis are particularly unstable emotionally, and laugh or cry in an explosive way on the slightest provocation; during the laugh a peculiar inspiratory "crow" is heard.

The cases are of sufficient interest to warrant reporting.

F. J., a married man, 33 years old, denied any knowledge of syphilitic infection, but on July 31, 1908, is stated by the family physician to have suffered from mucous patches and condylomata. Five months later he developed a right-sided hemiplegia, which rapidly cleared up under anti-

syphilitic treatment. For one year he remained well, then again complained of headache, insomnia, double vision, severe sciatica, inability to walk straight and a feeling of weakness. His wife had noticed the gradual onset, without any unconscious spell, of a right-sided hemiplegia which first involved his right leg, then right arm, and right face. Saliva dribbled from the corner of his mouth. Mentally he became childish, had laughing and crying spells, and was untidy in his personal habits.

On December 28, 1909, he was admitted to the clinical service of the Psychiatric Institute. At that time he was in a markedly unstable emotional condition, and laughed or cried at the merest trifles. However, he co-operated well in an examination, did not express any peculiar ideas, and to a certain extent realized that he was mentally sick. His power of retention of recent impressions, his grasp on current events and his ability to calculate were all found to be considerably impaired. The examination of his cerebro-spinal fluid showed a very abundant cell-count, and it was interesting to note that 50 per cent of the cells were of the polymorphonuclear variety. Films were prepared, but no micro-organisms could be demonstrated (Dr. Garvin).

During his hospital residence he continued to exhibit marked emotional instability, was mildly euphoric, and showed a gradual deterioration in his memory and general intellectual functions. He had forgotten two out of the three retention tests in five minutes, could not tell the Governor or Mayor of New York, and made mistakes in doing simple calculations, *e. g.*, $9 \times 7 = 54$. From time to time he complained of twitching of his tongue and of his left leg, but there was no convulsive seizure.

On March 16, 1910, he had a transitory paralysis of the external rectus muscle of the left eye. His fundi at this time were reported to be normal, while a perimetric examination showed only slight contraction of the field of vision in the upper half of the left eye. On March 22, 1910, it was noted that he had a double sign of Babinski, and a double ankle-clonus.

On April 27, 1910, a second examination of his cerebro-spinal fluid showed 30 cells per cmm., but now there was no excess of polymorph leucocytes; globulin tests were positive; the Wassermann reaction was positive with the blood serum but negative with the cerebro-spinal fluid.

Later still he became bedridden, deteriorated mentally, and his laughter and crying were even more explosive, and more easily provoked than formerly.

He now showed a well-marked nystagmus in all directions of gaze; his speech was exceedingly thick, slurring and monotonous; jaw movements were slow and difficult; the tongue was protruded straight, it could be freely moved, and showed no atrophy or fibrillary tremor; he was unable to cough voluntarily. On September 12, 1910, he developed a paralysis of the left side of the face, and of the external rectus muscle of the left eye, which disappeared under anti-syphilitic treatment.

On November 9, 1910, Dr. Sohier Bryant (visiting laryngologist) reported a paralysis of the soft palate and of the left vocal cord.

Finally the patient lost all control over his bladder and bowels, his speech became unintelligible, and great difficulty was experienced in swallowing. He died during the summer, 1911, but unfortunately permission for an autopsy was refused.

W. E. J., a printer, 40 years of age, four years after syphilitic infection started to complain of headache, blurring of vision, tinnitus, and poor memory. He was treated with anti-syphilitic remedies, and for 14 months was able to continue at work. Then again he became mentally confused, his memory became poor, his speech was noted to be defective, and he staggered when he walked.

On admission to the Psychiatric Institute on March 31, 1909, he presented a dull, drowsy, apathetic appearance. He said that he felt weak, but that he was perfectly contented. He was approximately correctly oriented for time and place. His memory for both remote and recent events was somewhat impaired, but he was able to give the main facts of his life correctly. He made mistakes in doing simple calculations, *e. g.*, $6 \times 9 = 30$, $15 + 17 = 36$. He had a fair realization of his condition, and showed no special abnormality of behavior.

Physically: He complained of headache which was worst at night, and of shooting pains in his legs. His sense of smell was impaired in both nostrils. He complained of having seen double for two weeks previous to admission, and exhibited a paralysis of the external rectus muscle of the left eye; his pupils reacted to light and on accommodation; his speech was thick, slurring, monotonous (bulbar variety); the right arm and leg were weaker than the left; the tendon reflexes were equally exaggerated on the two sides; and he had a double sign of Babinski.

On April 2, 1909, a lumbar puncture was performed and showed an abundant lymphocytosis.

On April 4, 1909, he was noticed to drag his left foot in walking.

In May, 1909, he was feeling much better mentally, but complained of weakness in the right side of his body, and said that his knife would occasionally drop from his right hand at meal times; the right foot was now dragged in walking. Gradually, under anti-syphilitic treatment, he began to show marked improvement both mentally and physically. He behaved naturally, became an efficient worker in the mat-shop, and was able to give a good retrospective account of his sickness. On April 5, 1910, a second lumbar puncture showed a doubtful cell count of 7 cells per cmm., negative globulin reaction, positive Wasserman reaction with the blood-serum but negative with the cerebro-spinal fluid.

The other physical signs also showed a marked improvement, so that eventually he was discharged in a very much improved condition.

C. G., a glass-blower, married, 39 years of age, was admitted to the Manhattan State Hospital on January 11, 1901. In 1890 he had sustained a head trauma, following which his disposition is said to have changed. He had also been exceedingly alcoholic. In 1899 he developed a left-sided hemiplegia (he was a right-handed man), and at the same time had a

transitory attack of inability to speak which lasted for five days. Following this he started to behave in an outrageous way towards his wife and family, became forgetful, and had two additional strokes of paralysis which, however, were poorly observed. On February 26, 1906, he was examined by Dr. Macfie Campbell, who found him to be considerably deteriorated mentally and without any true realization of his condition. He showed well-marked residuals of a left-sided hemiplegia, but his plantar response was noted as flexion on both sides; his speech was stuttering, thick, and at times quite unintelligible; his pupils reacted well both to light and on accommodation.

During the night of March 1, 1907, he is described as having an "attack of weakness," and in the morning was found to be able to utter only vowel sounds, but understood gestures and questions. Later he became very emotional, laughed in a fatuous way, and at times would be exceedingly irritable. He was unable to blow out a candle, had great difficulty in swallowing, and saliva continually dribbled from his mouth.

On September 9, 1909, Babinski's sign was found to be present on the left side, but on the right the plantar response was still flexion.

He eventually died from dysphagia.

The autopsy showed multiple bilateral small areas of softening in the region of the basal nuclei, due to a syphilitic endarteritis obliterans.

W. D., a bar-tender, married, 42 years of age, 15 years after syphilitic infection was admitted to the clinical service of the Psychiatric Institute on October 12, 1910. For four years previous to admission he had been noticed by his wife to be irritable in his disposition, and in the spring of 1910 was discharged from his employment on account of inefficiency. In August, 1909, he had complained of twitching in both legs, which later disappeared under treatment (the kind of treatment could not be specified). During the spring of 1910 he complained of dizziness and had two attacks of unconsciousness, after the second of which he gradually lost power in his left face, arm, and leg. His hemiplegic condition gradually became more and more marked, he had incontinence of urine, and became forgetful. At times he would become extremely irritable, would tell his wife to go to hell, and would laugh without reason. Just previous to admission he had a third attack of unconsciousness, but an adequate description of it could not be obtained.

On admission he showed an anxious, tearful state, but co-operated well in the examination, and expressed himself as hopeful in regard to his ultimate recovery. He misidentified the physician, called him Dr. Dean (Dr. H.), and said that he had known him for a number of years (which was false). His memory for recent events was considerably impaired, as he had no recollection of having had his photograph taken on admission, or of having been for several hours on another ward. He was able to give the main facts of his life correctly, but had great difficulty in correlating dates, *e. g.*, born in 1868, and came to U. S. A. in 1874 when 18 years old. He had a fair appreciation of time and place, did not

express any absurd or grandiose ideas, and hallucinations could not be demonstrated.

Physically: He presented residuals of a left-sided hemiplegia and also a diminution of touch and pain sense on the left side; there was no hemianopia. In addition his sense of smell was defective on both sides; both pupils were slightly irregular, reacted slowly to light but well on accommodation; hearing was impaired in the left ear; he had at times marked difficulty in swallowing, and saliva continually dribbled from the left side of his mouth; speech was thick, monotonous, and of the bulbar variety; writing showed some distortion of words; all the tendon reflexes were much exaggerated, and there was a double sign of Babinski.

The examination of his cerebro-spinal fluid showed 35 cells per cmm., positive globulin test, and positive Wassermann reaction both with the blood-serum and with the cerebro-spinal fluid.

For some time following admission he remained in an emotionally unstable state, was irritable, cantankerous, and at times tearful; but gradually, under anti-syphilitic treatment with mercurial inunctions, an improvement set in. On November 2, 1910, he expressed himself as feeling brighter, now realized for the first time where he really was, stated that he must have been out of his mind, and thoroughly appreciated his need of further treatment.

His hemiplegic condition gradually became less marked, the dulling of sensibility disappeared, and the pupils reacted quite satisfactorily.

Several months later a second examination of his cerebro-spinal fluid showed a negative cell-count, negative globulin reaction, and a negative Wassermann reaction both with the blood-serum and with the spinal fluid. His general physical and mental condition improved to such an extent that he was finally discharged as recovered.

W. S., 48 years of age, married, was admitted to the Royal Edinburgh Asylum on October 9, 1907. Previous to admission he is described as having been childish and confused, and had the delusion that he had lots of money which people were stealing from him. When examined in January, 1912, he showed a very unstable emotional condition, would laugh and cry in an explosive way without reason, and at times would become very irritable. He was very garrulous, went into great detail, but his memory showed numerous gaps for both recent and remote events. He showed very poor judgment, and had no insight into his condition.

Physically: The history in the case was very defective, but the physical examination revealed the following: The right side of his face was drooped, the right arm was not so strong as the left (right-handed man), but in walking the left leg was held stiff, and the left foot was dragged. The tendon reflexes were all exaggerated, but those on the left side were more exaggerated than those on the right. Babinski sign was present on the left side, and also an ankle-clonus; on the right side the plantar response was flexion. Right eye showed an internal ophthalmoplegia, and a paralysis of the fourth cranial nerve; the left pupil reacted promptly to light and on accommodation; his hearing was markedly impaired in the right ear.

His speech was thick and monotonous, and at times unintelligible; he had difficulty in swallowing, and saliva dribbled from his mouth.

The examination of his cerebro-spinal fluid was negative in every respect (Dr. Winifred Muirhead).

J. G., single, 35 years of age, was admitted to the Royal Edinburgh Asylum on August 21, 1907. He denied syphilitic infection, but for several weeks previous to admission had complained of severe headaches, and "terrible dizzy turns."

On admission he was described as disoriented for place, and confused in regard to dates; he had a slight paresis of the left side of his face.

When examined in January, 1912, he showed a markedly unstable emotional condition, would laugh or cry in an explosive way on the slightest provocation, and at times would become exceedingly irritable. He could not give the day, month, or year, knew that the place was a hospital but could not tell its name. His memory for recent events was extremely poor, and he had forgotten all the three retention tests after a period of three minutes. His grasp on general information was exceedingly defective, and he made mistakes in doing simple calculations, *e. g.*, $6 \times 4 = 20$. In contrast with the above he was able to give the main facts of his life correctly, and did not express any odd or peculiar ideas.

Physically: He presented residuals of a right-sided hemiplegia, but in walking showed a double spastic condition, and had a double sign of Babinski and a double ankle-clonus. He pupils reacted satisfactorily to light and on accommodation; speech was thick, slurring, and monotonous; there was some difficulty of swallowing and dribbling of saliva. The examination of his cerebro-spinal fluid was negative in every respect, and the Wassermann reaction was also negative with his blood-serum (Dr. Winifred Muirhead).

These cases have been fully reported not because they show any specially unusual features, but because they demonstrate very clearly both the mental and the physical characteristics of pseudo-bulbar paralysis. The first case of the series reported was particularly interesting, owing to the fact that the first examination of the cerebro-spinal fluid showed that 50 per cent of the cells were of the polymorpho-nuclear variety. Such a large percentage of polymorpho-nuclear cells is practically unknown in syphilitic conditions, and of course immediately raised the question of a mixed infection. There was, however, no special elevation of temperature, and the examination of films prepared from the cerebro-spinal fluid failed to show any organism. Subsequent examinations of the cerebro-spinal fluid failed to reveal any excess of these cells.

Another point in the case which deserves special emphasis is the fact that there was a paralysis of one vocal cord. Ferrier states that paralysis of one or both vocal cords in cases of pseudo-bulbar paralysis is extremely rare, but reports Oppenheim, Siemerling and Munzer as describing such cases.

3. MENTAL SYMPTOMS.

There has always been a great amount of uncertainty attached to the mental symptoms showing themselves in cases of cerebral syphilis, but now that we have come to the stage where we are trying to analyze the symptomatology of mental cases, to find out what the symptoms really mean, and to allow for the setting in which they occur, we may hope for a clearer formulation.

The main type of mental reaction is what has been described by Adolf Meyer and Hoch as an acute organic reaction, and is characterized especially by mental confusion, delirium, hallucinations, and a memory defect for recent events. At first, however, these patients may complain of a certain nervous uneasiness, may feel dull, changed, "mixed-up in the head," and have difficulty in thinking. Their emotional condition frequently shows striking variations, without any definite cause; at one time they will be excited, irritable, resistive and surly, and at another time will show a depressed, anxious, easily frightened state. In those cases where there is much increase of intra-cranial pressure, dull, stuporous, apathetic states, usually with loss of control over the organic reflexes, show themselves; but a feature which might be emphasized is that, when roused, these patients are often able to give a fair account of themselves, and are found to be not nearly so demented as their appearance might suggest. Hallucinations of sight or hearing are very often prominent features, and resemble to a certain extent the hallucinations seen in chronic alcoholics in that they are often accompanied by a marked fear-reaction. Some patients show a marked difficulty of comprehension, due to a disorder of attention; delirious states occur with a very imperfect realization of time and place; and a memory defect, especially for recent events is one of the most important and diagnostic mental features. In those cases of cerebral syphilis showing a progressive deterioration, diffuse memory defects

analogous to those occurring in cases of general paralysis are present; but the characteristic memory defect met with in cerebral syphilis consists, as stated before, of an inability to retain recent impressions. It is important to realize, however, that memory defects, no matter of what nature, when occurring in a setting of mental confusion have practically no value or importance in diagnosis. The judgment of the patient suffering from cerebral syphilis is usually relatively little disordered; he has as a general rule a good realization of and insight into his condition; and his personality is usually well retained. The term "retention of personality" is used in the sense that these patients take some pride in their personal appearance, behave in a natural way like patients in a general hospital, and realize that they are sick. In general paralysis, as contrasted with cerebral syphilis, the patients are usually untidy in their appearance, dilapidated and often outrageous in their behavior, and have not the slightest realization of their condition. Certain anomalous features not infrequently show themselves in the mental picture, but before describing these I will briefly report three cases to help to drive home the points already mentioned, and to emphasize the characteristic features of the disease.

F. P., single, longshoreman, 28 years of age, was admitted to the clinical service of the Psychiatric Institute on February 17, 1909. He had contracted syphilis in 1904, for which he had received about one month's treatment.

In November, 1908, he began to experience severe headaches localized principally to the frontal region; these gradually increased in severity, so that in February, 1909, he had to give up work. He next began to complain of weakness in his right arm and left leg, became dull mentally, spoke only in answer to questions, and cried a great deal. He lapsed into a dreamy, confused state, had no idea of time or place, and was filthy in his habits.

On admission he was in a dull drowsy state, took no interest in his surroundings, and cried during the examination. He complained of feeling weak, thought that he had been in the hospital for 14 days (really one), and could give no description of how he had travelled here. His power of retention of recent impressions was impaired. He denied ever having had any hallucinations at any time. His memory for remote events was excellent, and no discrepancies were elicited in his dates.

Physically: He complained of headaches and dizziness. He could not differentiate the test solutions for smell; the left pupil was slightly more dilated than the right, but they reacted promptly to light and on accommo-

dation; his speech was monotonous, but there was no gross disorder; his writing was almost illegible. His tongue was protruded towards the left, and there was a tendency to a sign of Babinski on the left side; his tendon reflexes were equally exaggerated; his gait was like that of a drunken man.

The examination of the cerebro-spinal fluid showed a positive pleocytosis.

The patient was immediately started on treatment with mercurial inunctions, and almost at once an improvement occurred. His headaches disappeared, he became less confused, started to take an interest in his surroundings, and to help in the work of the ward. In about one month's time he was able to give a good retrospective account of his trouble, and was practically in his normal condition. In October, 1909, he was discharged as recovered.

D. A., single, salesman, 21 years of age, was admitted to the clinical service of the Psychiatric Institute on August 31, 1910. He had contracted syphilis about one year previous to admission. One month previous to admission he became nervous and failed to carry out his orders. Later he started to talk in a confused way, said that he owed money, and that people were hounding him. He complained of drowsiness, felt mixed-up in the head, thought that he was going to receive electricity, and die a painful death. He was sleepless and restless at nights, and had both auditory and visual hallucinations.

On admission he had a dull, confused, frightened appearance, and talked in a rambling, semi-delirious way; *e. g.*:

"Are you married?"

"No, single, I don't know where it is—with the gold buttons—I was in a restaurant—I am not so strong."

"Your address?"

"No, I am not sick—but they gave me gas on the ship—I guess I shall sleep."

He talked in a confused way about his cousin Eva, said that he was married (false), and that he had married Eva's brother. He said: "Detectives wanted to arrest me because they found out that I had syphilis." He reacted to hallucinations of sight. He could not be got to co-operate in an examination for special tests of memory, grasp on current events, etc.

Physically: He complained of severe headaches, but could not be got to co-operate in the tests for smell and taste. His pupils reacted promptly to light and on accommodation; the right side of his face was flattened, did not move so freely as the left, and he could not close the right eye independently; his speech showed slight sticking but no distortion over difficult test words; his writing showed tremor and some confusion. The tendon reflexes were equally exaggerated on the two sides; there was marked tremor of tongue, facial muscles and hands.

The examination of the cerebro-spinal fluid showed 105 cells per cmm, globulin reactions were positive, and a positive Wassermann reaction was obtained both with the blood-serum and with the cerebro-spinal fluid.

The patient was immediately started on treatment with mercurial inunctions, and in addition, in November, 1909, received an intra-muscular injection of 0.5 gm. salvarsan. It was not until about one year after admission, however, that any striking improvement was noted in his condition. In July, 1911, he was noted as neat in his appearance, greeted the physician spontaneously, played a good game at checkers. He admitted having been frightened for several days previous to admission, as he thought someone was going to shoot him, and spontaneously remarked that at that time he must have been out of his mind. He had an amnesia for certain events just immediately preceding his admission.

He was finally discharged in an improved state, but quickly relapsed, and now is in a somewhat apathetic mental state.

L. H., single, 26 years of age, was admitted to the clinical service of the Psychiatric Institute on May 29, 1909. In 1902, four years after syphilitic infection, he lost the sight of his right eye, due to an optic atrophy. About six weeks previous to admission he began to complain of severe headaches, and had four transitory convulsive spells, each of which was accompanied by loss of consciousness. Following this he became "foolish-like," did not pay attention to what was said to him, and frequently had to be asked the same question over and over again.

On admission he was drowsy, confused, at times irritable and resistive, and would wet and soil himself. He frequently answered questions quite irrelevantly, complained of having become very forgetful, and reacted with fear to both auditory and visual hallucinations. He had a somewhat imperfect realization of time and place, and a poor memory for both recent and remote events, which was no doubt dependent on his state of mental dullness and confusion.

Physically: He complained of headache and presented residuals of a left-sided hemiplegia. His right optic nerve was atrophied, and the right pupil did not respond to light; the left pupil reacted promptly to light, and both reacted on accommodation. There was no gross disorder of speech or writing. The tendon reflexes were slightly more exaggerated on the left side; there was no sign of Babinski.

The examination of the cerebro-spinal fluid showed an abundant pleocytosis.

The patient was treated with mercurial inunctions and potassium iodide, and showed a gradual improvement both mentally and physically.

On September 17, 1909, a second examination of his cerebro-spinal fluid showed a negative cell count, and negative globulin reaction; the Wassermann reaction was not examined.

He was finally discharged as recovered.

In addition to these three cases another case may be reported, which showed in a very striking way the difficulty of comprehension, and the marked attention disorder frequently present.

A. L., steamfitter, 38 years of age, married, was admitted to the clinical service of the Psychiatric Institute on October 26, 1910. He had contracted syphilis in January, 1909, for which he had received several months' anti-syphilitic treatment with mercury. About six weeks previous to admission, however, he started to complain of frontal headache, dizziness, and sleeplessness, and talked in a rambling way about Indians, China, etc., so that it was quite impossible to carry on a connected conversation with him.

On admission he seemed bewildered, but laughed and smiled easily, and *when started on a topic could not be diverted from it; e. g.:*

"How do you feel?"

"I am away from Edison's six weeks or perhaps seven."

"Have you any dizzy spells?"

"No, not what you get from the hospital—I don't know—I have no thoughts whatsoever—my wife gave me a can to get something, but when I got on the street I did not know anything."

"Have you vomited?"

"The water was not so extravagantly good—then I went under the bridge which leads to the power house."

"What day is it?"

"Where I work now I am paid \$3 for eight hours' work," etc.

Even although his thought content was so greatly disordered as seen by the above samples, there was relatively no disintegration of his personality, and he readily co-operated in the work of the ward.

Physically: He complained of intense headache which was worse at night; his optic discs were muddy, but there was no definite neuritis; his pupils were widely dilated, but reacted promptly both to light and on accommodation; the right side of his face was slightly flattened; no speech or writing defect; the tendon reflexes were equally exaggerated on the two sides.

The examination of the cerebro-spinal fluid showed 123 cells per cmm., positive globulin tests, and a positive Wassermann reaction both with the blood-serum and with the cerebro-spinal fluid.

Under anti-syphilitic treatment with mercury and potassium iodide a marked improvement took place in regard both to his mental and to his physical condition; and he was finally discharged as recovered.

4. ANOMALOUS CASES.

It has already been stated that most cases of cerebral syphilis develop acutely, and within a few years after the primary infection; but other cases do occur which develop slowly and insidiously; the patients show a gradual falling off in their general efficiency, and accordingly from the type of onset raise the suspicion of a general paralytic process. Such a case was the following:

J. McC., 53 years of age, had contracted syphilis 22 years previous to the onset of any mental symptoms. For seven years previous to his admission to the hospital he had been so irritable in his disposition that his wife finally deserted him. Gradually his earning capacity declined, he had several transitory convulsive seizures, and showed a gradual mental deterioration extending over a period of several years.

On admission to the hospital he was found to be apathetic and contented, showed an especially poor memory for the retention of recent impressions, and made many mistakes in doing simple calculations. He was disoriented for time and place. He complained of headache and dizziness, and showed residuals of a right-sided hemiplegia. His pupils reacted well to light and on accommodation; his speech showed no gross disorder, but his writing showed tremor and mis-spelling. The tendon reflexes were more exaggerated on the right side, but no sign of Babinski could be elicited.

The examination of the cerebro-spinal fluid showed 7 cells per cmm., negative globulin reaction, a positive Wassermann reaction with the blood-serum, but negative with the cerebro-spinal fluid.

The diagnosis of cerebral syphilis was confirmed by autopsy, which showed a chronic low-grade syphilitic leptomeningitis, most marked at the base of the brain, and a syphilitic endarteritis obliterans.

Another case which serves to illustrate the gradual onset, and was also interesting in other respects, was as follows:

J. M., grocer, single, 40 years of age, eight years after syphilitic infection, and two years previous to admission, began to fall off in weight, complained of a feeling as if something was lying on his head, became downhearted, and was less efficient in business. A few days previous to admission to the Psychiatric Institute he had a dizzy spell, following which he became delirious.

On admission, June 15, 1910, he was in a semi-delirious state, misinterpreted the situation, commented on the notetaking, thought he was in a market, and talked as follows: "Well, I guess all right—what is that dozen you are putting down there—no, no we don't need all that for a week—we don't want steak and nothing—want only a couple of items," etc. He could not tell where he was, had lost track of time, and had a very poor memory for recent events. Auditory hallucinations were a prominent feature. He complained of headache and dizziness; his pupils reacted sluggishly but extensively to light and on accommodation; his speech was tremulous but without distortion; writing showed tremor and confusion. The tendon reflexes were equally exaggerated on the two sides. Tremor of tongue and fingers, but none of the facial muscles.

The examination of the cerebro-spinal fluid showed upwards of 100 cells per cmm, positive globulin test, and a positive Wassermann reaction both with the blood-serum and with the cerebro-spinal fluid.

Under anti-syphilitic treatment considerable mental and physical improvement took place, but the examination of his cerebro-spinal fluid always continued to give positive results.

The patient was able to be discharged, but, owing to the fact that the spinal fluid results were hardly, if at all, modified by the anti-syphilitic treatment, the case must be looked upon with considerable doubt.

GRANDIOSE IDEAS.

At one time it was thought that the expression of grandiose ideas of a rather fantastic nature, occurring in a setting of euphoria and associated with physical signs pointing to a syphilitic involvement of the nervous system, was more or less pathognomonic of cases of general paralysis. The expression of grandiose ideas, however, is not by any manner of means foreign to the mental picture of cerebral syphilis, and is much more common than is generally realized. In one of the cases reported by Matthews, confirmed by autopsy, the patient said that he had \$100,000 and 75 horses, and was markedly euphoric. Head has reported the case of a young man, 21 years old, who four years after primary infection became exalted, bought motor cars for which he could not pay, careered about the country at night, and behaved in an altogether spendthrift manner. Under vigorous anti-syphilitic treatment with inunctions a cure was effected. McBride has quoted a case where the patient said that he was the Duke of Argyle, that he was a special favorite of Queen Victoria's, and wrote letters to her calling her "his dearest love." Welsh, in a paper entitled "A Degenerative Form of Syphilitic Insanity," states: "The grandiose ideas seen in these cases frequently are of the same type as are seen in general paralysis." A large number of the cases whose records I have had the privilege of examining have expressed a feeling of well-being, and have boasted of their abilities. Three of my own cases are sufficiently noteworthy to be briefly cited:

J. C., 55 years of age, was admitted to the Psychiatric Institute with a complete right-sided hemiplegia, but stated that his head felt clear, that he was happy, that there was nothing the matter with him, and that he had come to the hospital to join the Order of Foresters. He was drowsy, had lost track of time, would constantly wet and soil himself, but continued euphoric and stated that he had \$10,000 (which was false). The autopsy showed a syphilitic endarteritis obliterans, and a moderate degree of syphilitic meningitis.

N. G. F., 36 years of age, eight months previous to admission in 1902, developed a permanent left-sided hemiplegia, and had a transitory attack of motor aphasia. At the present time (June, 1911) he is somewhat unstable emotionally, and talks in an extremely disconnected and grandiose way. At times he has called himself King of the Universe, the Supreme Being, a millionaire, etc. Notwithstanding the fact that his utterances are so fantastic, he remains bright and alert, has a keen appreciation of time and place, and takes a great interest in what goes on around him.

In addition to his left-sided hemiplegia he has a double sign of Babinski, and a double ankle-clonus; his pupils show the Argyll-Robertson phenomenon; his speech and writing are excellent and show no defect even when tested with difficult test-words. The examination of his cerebro-spinal fluid showed 50 cells per cmm., doubtful globulin reactions, and a negative Wassermann reaction both with the blood-serum and with the cerebro-spinal fluid.

J. M. B., 60 years of age, for several weeks previous to admission had been noticed by his wife to be "not quite right," talked big, and told his wife that she would be a very rich woman some day. He then later became excited, restless, and very elated, ordered \$50 worth of provisions to be sent to the Lincoln Hospital, said that he was going to marry a nurse, that he would buy his wife "brand new silk clothes," and that he himself was a real estate agent. He presented physical signs pointing to a syphilitic involvement of his nervous system.

These three cases, it seems to me, should teach one not to be too easily led astray by the expression of grandiose ideas, but where they occur to carefully study the constitution of the individual, and the setting in which these grandiose ideas occur. If the patient is mentally confused, they mean absolutely nothing; but if the sensorium is clear, they point more to general paralysis than to cerebral syphilis, although, as stated previously and as the three cases reported show, they are not at all uncommon in the latter disease process.

CONFABULATORY STATES.

Another anomalous feature that sometimes occurs in cases of cerebral syphilis is the presence of a confabulatory state similar to that seen in cases of Korsakow's type of alcoholic psychosis. Kraepelin and Nonne remark on its occurrence, and cases have been reported by Chaslin and Portocalis, Roemheld, Ferchmin, and Mooers. The condition is of sufficient interest and rarity to warrant one in reporting a case which showed this confabulatory state to a marked degree.

J. C., a native of France, 40 years of age, was admitted to the clinical service of the Psychiatric Institute on January 7, 1910. He had always been temperate in the use of alcohol, and had held his positions satisfactorily. He denied ever having had syphilis, but gave a history of gonorrhœa five years previous to admission. For several months previous to admission he had been silly and confused, had lost control of his bladder, ordered expensive things, and talked nonsense.

On admission he was puzzled and confused, had imperfect control of the bladder, and some difficulty in swallowing. Subjectively he had a general feeling of well-being. The striking features about his condition were his complete disorientation for time and place, his extremely poor power of retention, and the fact that he fabricated freely, and was extremely suggestible. He could not retain any simple test for more than a few seconds, thought that he was in a naval academy, that the most demented-looking patients imaginable were his fellow-students, recognized the physician as a Frenchman, and although repeatedly corrected day after day for many months, called him his "cousin Claude," thought that the charge-attendant was a professor of mathematics, and so on. He was able to give the main facts of his life correctly; and although he had practically no realization of his condition, yet his personality, as reflected by his general behavior and manner, was well retained.

Physically: He presented residuals of a left-sided hemiplegia; his sense of smell was very defective on both sides; vision in the right eye was entirely lost, due to a post-neuritic atrophy, and the pupil did not react to light or on accommodation; the left pupil reacted to light and on accommodation; he had a central nystagmus; his speech and writing, even over difficult test-words, were excellent.

The examination of his cerebro-spinal fluid showed 400 cells per cmm., positive globulin reactions, positive Wassermann reaction with the blood-serum but negative with the cerebro-spinal fluid.

He has been treated for months with anti-syphilitic remedies, but no material change has occurred in his condition.

Before concluding this discussion of the symptomatology of cerebral syphilis, I wish to direct attention to those cases of syphilitic endarteritis obliterans of the small blood-vessels which were first described by Nissl and Alzheimer.

Nissl has described one case, Alzheimer has described in all about nine cases, and more recently Sagel and Ilberg have each described a case.

The clinical features are very varied, are difficult to recognize, and seem to depend on the acuteness and diffuseness of the process. The difficulties of diagnosis may be readily appreciated if one glances at the diagnoses in the last six cases reported by Alzheimer; one was diagnosed as epilepsy, one as catatonia, one

as general paralysis, two as stationary paralysis, and only one as cerebral lues. Sagel's case was also clinically a very atypical one, and was rendered more difficult than usual on account of the fact that the psychosis developed while the patient was in an anæmic condition, and was suffering from a carcinomatosis of stomach and liver. The mental condition consisted essentially of a confused fearful state, with hallucinations of sight. Attention is drawn to the fact that, although the histological examination of the brain made the diagnosis of syphilis of the small blood-vessels certain, there never at any time had been any convulsive seizures. Ilberg's case was that of a woman, 22 years of age, who had always been somewhat dull and peculiar, and who came from a poor stock. Her illness started with convulsions, but later she showed a catatonic state characterized by negativism, cerea flexibilitas, stereotypies, impulsiveness, and hallucinations. During life the diagnosis was unclear; an atypical case of general paralysis, a mental disorder associated with diffuse brain syphilis, and catatonia were all considered. The autopsy showed a syphilitic endarteritis of the small blood-vessels.

None of my cases have shown this condition of syphilitic endarteritis of the small blood-vessels; in obscure cases such a diagnosis must always be thought of.

5. CEREBRO-SPINAL FLUID.

In a former paper on the cerebro-spinal fluid, published in March, 1912, I reviewed the results which I had obtained in the cytological, chemical and serological examination of 118 cases of mental disorder, 20 of which were cases of cerebral syphilis.

In 19 of these 20 cases of cerebral syphilis a pleocytosis was obtained; in 15 out of 19 cases a positive globulin reaction was obtained; 16 cases were examined by the Wassermann reaction, using the Noguchi modification, 94 per cent of which gave a positive reaction with the blood-serum, but only 50 per cent gave a positive reaction with the cerebro-spinal fluid. A pleocytosis and positive globulin reaction are found almost invariably in both cerebral syphilis and general paralysis; they point simply to there being an inflammatory involvement of the nervous system, and cannot be used with any degree of certainty in differential

diagnosis. With the Wassermann reaction, however, a different state of affairs exists. It has already been pointed out how, in cerebral syphilis, only 50 per cent of my cases gave a positive Wassermann reaction with the cerebro-spinal, whereas in general paralysis 90 per cent positive results were obtained from an examination of 53 patients—a difference of 40 per cent.

Much more striking differences have been reported by Plaut, Nonne, and numerous others.

Here, then, we have a point which should be of considerable help to us in differential diagnosis, but it must be remembered that it is one which cannot be absolutely depended upon. All we can say is that, in the cases which show a positive Wassermann reaction both with the blood-serum and with the cerebro-spinal fluid, the diagnosis of general paralysis is more indicated than one of cerebral syphilis. We are in no position to draw up hard and fast rules in regard to the exact significance of the Wassermann reaction, as many cases of cerebral syphilis—according to my experience those of a very acute nature—do give as strong a positive reaction with the cerebro-spinal fluid as with the blood-serum; it is the long-standing, non-progressive cases which tend to give the negative reactions. In each individual case the Wassermann reaction should be closely correlated with the clinical findings, and definite conclusions should only be based on carefully examined autopsy material.

Several cases may be referred to:

A. McK. had a negative cell-count, negative globulin reactions a doubtful Wasserman reaction with the blood-serum, and a negative reaction with the cerebro-spinal fluid. The patient was a young man, 26 years of age, who, 18 months after the primary infection, suddenly developed a right-sided hemiplegia and a motor aphasia. He had been systematically treated with anti-syphilitic remedies for a long period of time. Although he was admitted in an irritable, excited state, yet during his hospital residence he showed no signs of an active syphilitic process.

J. McC. had a cell-count of 7 cells per cmm., negative globulin reaction, a positive Wassermann reaction with the blood-serum, but negative with the cerebro-spinal fluid. This was the case in which the mental symptoms developed 22 years after the primary infection, and which on account of the insidious nature of the onset brought up the question of general paralysis. The clinical diagnosis of cerebral syphilis was confirmed by autopsy.

In two of my cases the examination of the cerebro-spinal fluid was performed by Dr. Winifred Muirhead, Royal Edinburgh Asylum, who reported negative results throughout. These two cases both showed pseudo-bulbar symptoms, and had been non-progressive for several years.

In 1907 Alzheimer perfected a method for the differential estimation of the cells of the cerebro-spinal fluid, by which he hoped to receive help in coming to a correct diagnosis in certain forms of nervous and mental disease. Using Alzheimer's method, Dr. Winifred Muirhead and myself at the Royal Edinburgh Asylum examined a series of 54 cases, principally of mental disorder, with a view to seeing how far we could use it as a diagnostic aid.

Rehm had used Alzheimer's method over a large and varied material, and had come to the conclusion that plasma and gutter cells were present in the cerebro-spinal fluid of general paralytics more constantly and in greater numbers than in other forms of nervous or mental disease. Furthermore, Rehm was unable to demonstrate plasma cells at all in cases of *tabes dorsalis*. Our results did not entirely confirm those of Rehm.

Our series of cases included 26 cases of general paralysis, in all of which plasma cells were found varying in number from 1.5 to 16 per cent; gutter cells were found, in all but three cases, in small numbers.

In the four cases of cerebral syphilis examined by us, we were unable to demonstrate either plasma or gutter cells, but this was probably due to the fact that each one of our four cases had been non-progressive for several years, and each gave a negative quantitative cell-count. Other observers, *e. g.*, Rehm, Hough, have found plasma cells and gutter cells present in the cerebro-spinal fluid in cases of cerebral syphilis, but apparently not in such large numbers or so constantly as in general paralysis. It seems to me, however, that at present we have not quite sufficient evidence to allow us, by this method, to draw a distinction between general paralysis and cerebral syphilis, especially when one considers that the percentage of plasma cells in general paralysis varies all the way from 1.5 to 16 per cent.

Owing to the fact that Rehm was unable to demonstrate plasma cells in his cases of *tabes dorsalis*, it was thought that here we had a sure sign which would allow us to differentiate between

cases of *tabes dorsalis*, with a mental disturbance non-paralytic in nature, and cases of general paralysis. In two out of three cases of *tabes dorsalis* examined by us we were able to demonstrate the presence of plasma cells. The case in which we failed to find plasma cells had been non-progressive for a number of years and also had a negative quantitative cell-count, negative globulin reaction, and negative Wassermann reaction both with the blood-serum and with the cerebro-spinal fluid.

From our results, then, we may say that although Alzheimer's method is the best one yet devised for a careful estimation of the cell types in the cerebro-spinal fluid, it has not as yet been proved of any special value in enabling us to differentiate between those disease processes which we include under the term organic psychoses.

DIFFERENTIAL DIAGNOSIS.

As has already been mentioned, general paralysis is the condition, more than any other, which is apt to be confounded with cerebral syphilis. The points of difference between these two affections have already been fully gone into, and it is not my intention to again recapitulate them, but the matter might be focused a little by emphasizing one or two main points.

An onset occurring within the first few years after syphilitic infection, especially when accompanied by a history of headaches, dizziness, sleeplessness, and cranial nerve palsies, practically always means an acute syphilitic process of the nature of a meningitis, endarteritis, or gumma; general paralysis, on the other hand, comes on in a slow, insidious way, usually with a history of falling off in general efficiency, outrageous behavior, mental dullness, and a diffuse memory defect. In other words, the onset in cerebral syphilis is usually with somatic signs, whereas in general paralysis the mental symptoms tend to predominate. In cerebral syphilis the mental picture is of the nature of an acute organic reaction, and consists essentially of confusion, disorientation, a poor memory for recent events, frequently hallucinations, and delirium; in addition it is well to note that the personality is well retained and that the patient has a good realization of his condition. In general paralysis one has what may be called a chronic organic reaction characterized by a general intellectual deterioration, a

diffuse memory defect, absurd delusions, and total lack of insight.

In regard to the physical signs, the one which seems to me to be of most value is the bilateral presence or absence of the Argyll Robertson phenomenon. It is rare indeed that Argyll Robertson pupils are found in cases of cerebral syphilis, whereas they occur relatively frequently in cases of general paralysis; in cerebral syphilis the speech and writing are seldom distorted, and tremor of the facial muscles is rarely present. Other differential symptoms between cerebral syphilis and general paralysis, such as the type of convulsions, cranial nerve palsies, and the Wassermann reaction, have already been sufficiently referred to.

It must be frankly admitted that in neither affection can one rely on any pathognomonic sign; but I venture to say that if the above-mentioned points are kept clearly in mind, wrong diagnoses will be the exception.

Arterio-sclerotic brain disease non-syphilitic in origin is another condition which may have to be ruled out. As a general rule it is comparatively easy to do so, owing to the fact that it usually comes on in individuals over fifty years of age, and is characterized by an irritable, emotional mental state, and a memory defect of a lacunar nature; in addition, the examination of the cerebro-spinal fluid shows almost invariably a negative cell-count and negative globulin reaction, while the Wassermann reaction is negative both with the blood-serum and with the cerebro-spinal fluid.

Another disease which sometimes may cause the diagnosis to be in doubt is disseminated sclerosis, but here again the cerebro-spinal fluid findings should almost conclusively differentiate between the two processes, as in disseminated sclerosis the results are, except for an occasional positive cell-count, almost uniformly negative.

PROGNOSIS.

The prognosis in cerebral syphilis may be said to depend on four main factors: (1) the early recognition and manifestation of the disease, (2) the age of the individual, (3) the pathological type, (4) the amount of systematic treatment.

There can be no doubt that, just as in other disease processes, *e. g.*, tuberculosis, the earlier the disease is recognized the better are the chances for ultimate recovery.

Those who have expressed themselves on this subject agree in saying that those cases have the most hopeful prognosis which occur within the first few months or years after the primary syphilitic infection. That has been my experience also; but that excellent results may occasionally be obtained with cases which have developed more than ten years after primary infection, is well exemplified by one of the cases of pseudo-bulbar paralysis, already reported, which developed 15 years after infection in a man 42 years old.

Another case, which developed 16 years after primary infection, is also interesting from the same point of view:

M. H., 45 years of age, was admitted to the clinical service of the Psychiatric Institute on January 17, 1911. In August, 1910, he had had a transitory convulsive seizure, following which he became dull, drowsy, and somewhat childish.

On admission he was dull and apathetic, but showed no special psychotic features. His power of retention of recent impressions was somewhat impaired; but on the whole his memory was well retained, and he had an excellent realization of his condition.

Physically: He complained of headache and dizziness, and presented residuals of a left-sided hemiplegia; *e. g.*, left face flattened, tongue protruded to the left, weakness of the left arm and leg, knee-jerk was more exaggerated on the left side, Babinski sign was present on the left side, and the abdominal and epigastric reflexes were absent on the left side. When his sense of smell was being tested he said spontaneously; "I can't smell anything." His pupils reacted promptly to light and on accommodation; his speech was thick, but there was no distortion even of difficult test-words; writing showed omission of letters and words. Tremor of tongue, hands, and facial muscles.

The examination of the cerebro-spinal fluid showed 141 cells per cmm., positive globulin reaction, a positive Wassermann reaction with the blood-serum, but negative with the cerebro-spinal fluid. He was treated at first with mercury salicylate gr. 1, intra-muscularly once a week, and later with mercurial inunctions and potassium.

On February 16, 1911, the examination of the cerebro-spinal fluid showed 35 cells per cmm., and positive globulin reaction.

On April 24, 1911, a third lumbar puncture showed 11 cells per cmm., negative globulin reaction, a positive Wassermann reaction with the blood-serum, but negative with the cerebro-spinal fluid.

He has also shown a very marked improvement in his general condition.

Such cases, it seems to me, should help to engender a spirit of hope in regard to the treatment and prognosis of cases which perhaps at first sight look somewhat discouraging. In addition

to emphasizing the fact that here we had a recovery and an improvement in cases developing respectively 15 and 16 years after infection, it is noteworthy to remark that the patients were both over 40 years of age. The prognosis should always be considered less favorable when a patient is over 40 years of age, owing to the fact that vascular changes of a fibroid type are then apt to have set in and consequently the recuperative power of the individual is considerably impaired.

Of the various forms of syphilitic disease of the nervous system, those of a meningitic and gummatous nature are by far the most amenable to treatment; the most that one can hope for in vascular disorders, especially those which have given rise to areas of softening, is to arrest the further progress of the disease.

Fournier, out of 90 cases, gives his percentage of recoveries at 33.3; and Rumpf, out of 34 cases, at 35.2 per cent. Mickle has stated that one-fourth recover, another fourth improve considerably, and half die or survive with grave disease. The most striking statistics are those recently reported by Krower, who, out of a series of 59 cases treated with anti-syphilitic remedies, states that 35 cases completely recovered, 11 showed considerable improvement, 4 showed moderate improvement, and 5 died. Out of my series of 26 cases, 6 have recovered, 4 showed considerable improvement, 6 remained unimproved, and 10 died.

When one remembers that the majority of cases which one had to deal with were in an advanced stage of the disease, the above statistics should be considered as quite encouraging.

In every case, however, no matter how flattering the recovery or improvement has been, the danger of a relapse is a very real one and should be guarded against by strongly urging the patient to refrain from excesses of every kind. Provided that systematic and thorough treatment can be carried out, I would strongly urge the adoption of a more hopeful attitude towards this type of case than has heretofore been held.

TREATMENT.

Great differences of opinion have existed, and unfortunately still do exist, in regard to the best method of treating syphilis. The ideal method would be the prophylactic one of refraining from exposure to primary infection; but as that is a plan which

probably will never be generally accepted, it is our duty to adopt some practical means of curing, or of arresting the further progress of the disease.

Before the introduction of salvarsan, the two drugs most frequently relied on in the treatment of syphilitic diseases of the nervous system were mercury and potassium iodide. Mercury has now been conclusively proved by Metchnikoff and Roux to have the power of destroying the spirochæte pallida, and therefore it must be regarded as a genuine anti-specific remedy. Potassium iodide apparently has no such anti-specific power, and in the treatment of syphilis is simply an adjuvant to the mercury, helping to eliminate the products disorganized by the mercury. On account of this eliminative faculty, Gowers used to recommend that mercury and iodide be not given together, as by doing so the iodide would tend to hinder the retention in the system of sufficient mercury to act upon the processes of the disease. Gowers also strongly believed in giving only small doses of the iodide, usually from 7 to 15 grains, asserting that larger doses, especially in endarteritic conditions, were dangerous, owing to the power they possessed of tending to increase the coagulability of the blood.

In a recent "Discussion on Syphilis" reported in the Proceedings of the Royal Society of London, Jonathan Hutchison, D'Arcy Power, Lane, McDonagh and others express somewhat divergent views in regard to the best mode of administering mercury; but all unanimously agree that to get really good results it must be employed in a thoroughly systematic way.

I have principally employed the inunction method and have found it extremely satisfactory; it is painless, and is much less liable to set up gastro-intestinal disturbances than the intra-oral method. The method of procedure was as follows:

From $\frac{1}{2}$ to 1 drachm of Unguent. Hydrarg. was prescribed to be rubbed into a different non-hairy part of the body daily for six successive days. A warm bath was given after every series of rubbings, and no mercury was given on the seventh day. Such a series of rubbings must vary with the individual case, and should be continued until the gums feel sore. Usually, after about four weeks the mercurial treatment was stopped and the patient was prescribed potassium iodide in 15-grain doses three times a day.

By this method of alternating the drugs, one can keep up anti-specific treatment for a long time without any ill effects; it really carries out Gower's *dictum* that specific treatment should be "brief, renewed, but not continuous."

In certain cases where it is necessary to bring the patient quickly under the influence of the drug, intramuscular injections are exceedingly useful, and in the case of private patients they are to be preferred for the following reasons: (1) the method is cleanly; (2) the dose of the drug can be carefully regulated; (3) it is not an almost constant proceeding, as with the inunction method.

Many different preparations may be used, but the creams of calomel and metallic mercury, as recommended by Lambkin, Power and others, appear to be among the best.

Although mercury is an excellent drug to employ, there are a certain number of cases which are especially resistant to it, and which despite it, develop syphilitic affections of the nervous system. One such case in my own experience was as follows:

F. C., 46 years of age, was admitted to the clinical service of the Psychiatric Institute on November 9, 1909, in a confused, delirious mental state.

Physically: He was poorly nourished, was markedly salivated, and complained of severe headaches. His pupils were unequal, irregular, and Argyll-Robertson. (Co-operation was poor.) The right side of his face was paralyzed; his tendon reflexes were equally exaggerated on the two sides; the examination of the cerebro-spinal fluid showed a marked pleocytosis. A letter from the patient's family physician stated that the patient had contracted syphilis in 1904, *e. g.*, chancre, skin rash, and falling out of hair, for which he was systematically treated for four years with mercury and potassium iodide. Several weeks previous to admission he began to suffer from intense headaches, and was ordered potassium iodide, gr. xx, three times a day; bichloride of mercury pills, gr. $\frac{1}{4}$, three times a day; and in addition, hypodermic injections of mercury salicylate, gr. i every week. This treatment was continued up until the time of his admission to the Psychiatric Institute. He died nine days after admission.

The autopsy showed a well-marked syphilitic meningitis and endarteritis (Heubner's type).

Such a case as the above focuses the question as to whether we are dealing with a specially virulent type of organism or with an individual who has a very highly susceptible nervous system. It is in such cases—namely those that are exceedingly resistant to mercury—that salvarsan appears to have its greatest value. When salvarsan was first introduced, it was thought that at last a certain

cure for syphilis had been discovered, but its early promise has not been quite realized. That it is an exceedingly valuable remedy cannot for one moment be questioned, but the results from its administration will have to be followed for a number of years before one will be entitled to express a definite estimate of it. The intra-venous method of administration is now in most favor.

Shortly after the drug was first introduced, and while it was still in its experimental stage, I treated several cases of cerebral syphilis by 0.5 gm. injected intra-muscularly. No appreciable benefit resulted from any of these injections, but the probability is that it was not the drug, but the method of administration and the dosage, which were at fault. The technique of administration and of dosage has now been carefully worked out, and beneficial effects almost invariably follow its use in every form of syphilitic disturbance, with the exception of general paralysis, and to a less degree locomotor ataxia.

The custom now is to give a series of intra-venous injections, at a few days interval, until from 2 to 6 gm. have been introduced. McDonagh asserts that the whole secret of the intra-venous method of administering salvarsan is to employ only distilled water which has been redistilled a few hours before the operation; by taking this precaution all unpleasant symptoms, such as vomiting, rigors, headache, can be wholly avoided.

Neo-salvarsan has recently been coming into vogue; it is recommended on account of its having no after-effects, and because much larger doses can be given at shorter intervals, owing to its being more rapidly excreted, and less toxic than salvarsan.

At the meeting in London already referred to, everyone spoke highly of the value of salvarsan as a therapeutic agent, but this proviso was added: *only as an adjuvant of mercurial treatment*, the hypothesis being that "salvarsan kills adult and free spirochætes, while it has little effect upon those which do not lie in close apposition with the blood- and lymph-paths, upon immature forms, or upon those in an intra-cellular stage." At the present time, then, one would say that the best results are probably being obtained by using a combination of mercury and salvarsan.

Whichever method is used, the effect of treatment can now be gauged with a fair amount of accuracy by means of the examination of the cerebro-spinal fluid and blood-serum.

More recently still, Ellis, in the Rockefeller Institute, New York, has been employing a method of *intra-spinal* treatment, with which he has been obtaining splendid results, particularly in cases of cerebro-spinal syphilis and tabes dorsalis. His results have not as yet been published, but I have had the privilege of examining a number of his cases and records and can vouch for the beneficial effects of the method of treatment employed by him. The rough details of his method of treatment are as follows:

One hour after the patient himself or a definitely syphilitic patient has had an intra-venous injection of salvarsan, a certain amount of blood, usually about 50 cc., is withdrawn and centrifuged so as to free the serum from red blood corpuscles; the serum is then heated at a temperature of 56° C. for half an hour, after which it is injected intra-spinously into the patient to be treated.

By using this method the cerebro-spinal fluid findings have been greatly influenced, and in addition the "lightning pains" of tabetics have been greatly alleviated.

Since the methods above outlined, on the whole, prove so satisfactory, one need hardly consider the strenuous surgical methods recommended by Horsley. Horsley has stated that if improvement does not occur in the case of a gumma from six weeks' medicinal treatment, it should be removed surgically. He sees an analogy between the subdural and intra-peritoneal spaces, and upon this basis, in cases of acute meningitis, chronic pachy-meningitis, and syphilitic optic neuritis, recommends opening into the subdural space and irrigating with sublimate solution (1 in 1000).

SUMMARY.

1. This thesis consists of the systematic clinical analysis of 26 personally observed cases of cerebral syphilis, in seven of which the diagnosis was confirmed by autopsy.

2. Cerebral syphilis plays an important part in the production of mental disease, and should occupy a more prominent place among the organic psychoses than it heretofore has done.

3. The *spirochete pallida* has for long been surmised to be the causal organism, but it was not until 1910 that Strassmann first demonstrated its presence in the central nervous system of an adult with acquired syphilis; the second case is reported in this thesis.

Trauma, alcoholism, and physical and mental strain are important contributory factors.

Re-infection with syphilis is quite possible provided the initial infection has been thoroughly cured.

4. Anatomically, three main types of cerebral syphilis are differentiated; viz., meningitis, endarteritis, and gumma. Clinically, this differentiation is seldom possible, and is without practical value, as the treatment is the same in all irrespective of the type.

5. The majority of cases of cerebral syphilis develop within the first three years after primary infection, and rarely more than ten years after infection; this is in striking contrast to cases of general paralysis and locomotor ataxia, which almost invariably develop at a period more than ten years after infection.

6. In regard to the physical signs, the Argyll Robertson phenomenon is the one on which most weight should be laid in differential diagnosis, as it is rarely present in cases of cerebral syphilis. Other important features are: (a) an acute onset with headache, dizziness, and vomiting; (b) cranial nerve palsies; (c) convulsions without loss of consciousness, but usually followed by permanent focal symptoms; (d) intactness of speech and writing; (e) absence of facial tremor.

7. Cerebral syphilis not infrequently causes pseudo-bulbar paralysis, and six cases of this affection have been here reported.

8. The mental symptoms of cerebral syphilis are of the nature of those seen in acute organic reactions, and consist of confusion, delirium, amnesia, hallucinations, retention defect, and a poor memory for recent events; in addition there is relatively little disintegration of the personality.

9. The Wassermann reaction must be considered in relation with the clinical picture in each individual case; when the Wassermann reaction with the cerebro-spinal fluid is negative, the diagnosis of cerebral syphilis is indicated.

10. It is frankly admitted that there is no pathognomonic sign for cerebral syphilis; but if the nature and character of the onset and the above-mentioned physical and mental symptoms and signs are correlated, a disease entity is formed which has every right to be considered characteristic.

11. Anomalous features, among which may be mentioned euphoria and grandiose ideas, and confabulatory states, are more

common in cerebral syphilis than is generally recognized; special attention must be paid to the setting in which these features occur, because when occurring in a setting of confusion they mean practically nothing.

12. Recent statistics confirm one in the opinion that the prognosis of cerebral syphilis, as compared with other organic affections of the nervous system, is relatively good; the most favorable cases are those which develop soon after the primary infection, and those of a meningitic or gummatous type.

13. Mercury, no matter in what form administered, is an exceedingly valuable drug in the treatment of syphilis, provided that it is given in a systematic way. The best results are, however, probably obtained by combining mercurial and salvarsan treatment. Potassium iodide acts simply as an eliminative agent, and has no specific action on the spirochæte pallida.

The only safe treatment is prophylaxis.

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A CLINICAL CONTRIBUTION TO THE IRREGULAR AND UNUSUAL FORMS OF STATUS EPILEPTICUS.

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FOREWORD.

The cases embraced in this study form the unpublished part of the original manuscript awarded the Stevens Triennial Prize of Columbia University for original research, 1903, entitled: "Status

Epilepticus: A Clinical and Pathological Study in Epilepsy," by L. Pierce Clark and Thomas P. Prout, *American Journal of Insanity*, Vol. LX, Nos. 2, 4, and Vol. LXI, No. 1, 1903-4. The case studies were not embodied in the publication of the essay on account of the length of the general text and the expense which would be entailed thereby. A few illustrative clinical charts were, however, printed with the article. The typical and classic cases of status upon which the general text of the published essay was founded form no part of this paper. However, parts of these irregular and unique cases of status have been used in my "Studies in Epilepsy," *Archives of Neurology and Psychopathology*, Vol. II, 1899, in my chapter upon Status Epilepticus in Spratling's work on "Epilepsy and its Treatment," Saunders & Company, 1904, and in the prize essay above mentioned, but the full exposition of the unique characters and the unusual status types and their interpretation are here recorded for the first time. They are all taken from my service at the Craig Colony for Epileptics, 1895-1901, while I was first assistant resident physician at that institution. I am especially indebted to Dr. T. P. Prout for supplying the notes of the microscopical examinations of a few of the individual cases here given. My best thanks are due to Dr. E. A. Sharp for assistance on the clinical charts accompanying the case histories.

To those of us who have had institutional experience with chronic epileptics the clinical picture of status epilepticus is all too well known. It forms about ten per cent of the deaths in epileptics. It is the true climax of the comitial disease and most to be dreaded, as fully a third of all cases die in the attack. To those not fully cognizant of the usual picture of the status we may present the following short summary in contrast to which I desire to present some of the curious and interesting anomalies of the condition.

Usually one seizure of the grand mal type follows another of the same character a few minutes or seconds apart. Generally the attacks occur with an interval of one-half hour or a full hour at the onset. Each attack is complete and separate from its predecessor, keeping the peculiar individuality common to each case of epilepsy. In Jacksonian, or better, partial epilepsy, the single

seizure of the status holds to a distinct order of invasion, so long as exhaustion is not extreme and the definite order of muscular involvement is continued throughout the status. At first consciousness is completely regained between paroxysms; a little later, as the periods between attacks shorten, consciousness is but partly regained, and finally the comatose state is not rallied from between attacks, and the stupor slowly deepens into profound coma. In all cases in which a definite order of muscular involvement obtains the subsequent coma is less profound and the status in consequence is less severe. As the attacks culminate in their greatest frequency the period of rest between convulsions may be entirely omitted and some one part of the body may remain continuously in spasm; the part last involved in convulsion not ceasing from agitation before the muscles engaging in the initial stage of the next paroxysm begin again to sweep the rounds of the muscular invasion of the subsequent fit. The spasm may be incessantly clonic, or there may be a slight lessening of paroxysmal intensity, thus marking the end and the beginning of isolated discharges; this overlapping is almost always seen in the climax of the convulsive stage of fatal status. With the increasing frequency of attacks the paroxysms usually diminish in intensity; the tonic period, if present at the beginning, may be obviated or omitted entirely in the advanced status. The paroxysms at the end of the convulsion may be localized to a single muscle or a small group of muscles. Generally in status composed of fulminant convulsions, of general and simultaneous involvement, the end of the convulsive stage sees only slight general or fibrillary tremors throughout the whole body. As the exhaustion increases after the first few attacks there is elevation of temperature, increased pulse rate and respiratory frequency. The pulse and temperature may surmount to a great height, the temperature to 107° or 108° F., and pulse to 160 or 200 per minute. At last the convulsions lessen in frequency and the stuporous stage is ushered in with the coma of collapse, which picture is analogous to that of the coma of adynamic fever, such as typhoid. This state is but the resultant exhaustion from the convulsive stage; exhaustion, as it were, being piled upon exhaustion. The mouth is foul, the tongue is dry and fissured, and the skin is covered with cold, clammy sweat; swallowing becomes

difficult or impossible. The urine is usually voided and stools may be passed involuntarily.

The patient may die of the asphyxia in the paroxysms, although as a general rule he passes a few hours in profound coma, in which stage, until death or convalescence, slight convulsive tremors may occasionally occur. Such convulsive phenomena are but mere phantoms of the former severe convulsions. Therefore one sees how purely arbitrary the clinical division of status into two stages may appear; in the one convulsion, and in the other coma predominates.

All the deep and superficial reflexes are abolished in the coma; the respiration becomes loud, noisy and stertorous in character; the temperature and pulse may undergo marked alteration depending upon the frequency and intensity of the foregoing symptoms. Death may terminate the stuporous stage at any time. If recovery is to occur, coma wears away, and is slowly replaced by stupor, which in turn may be followed by mild delirium or hallucinations, which semi-exhausted state is finally replaced by a more or less rapid convalescence, and the patient resumes the pre-status condition in a week or ten days. Generally, if recovery does not follow more or less promptly, a low muttering delirium supervenes, extensive sloughing of the nates follows and life itself is more or less suddenly terminated. The foregoing constitutes the usual clinical picture of a case of typical status epilepticus.

In studying the problem of epilepsy it may be said that the distinction between different types of convulsive fits is largely confined to the motor aspects of the muscular march. The desire for therapeutic advance in neurological surgery seems to have been the main incentive to even this clinical differentiation. Thus, given an epileptic fit which begins in the one hand or foot, and operative interference is at once thought of as a relief to the irritated cortical centers. The usual unfortunate outcome from a therapeutic point of view in such an attempt at relief teaches us to discount the obvious, the focal character of the convulsive fit, and give attention to the more subtle psycho-sensory phases of focal epilepsy. Modern methods of intensive psycho-sensory analysis in the epilepsies, just begun in this country and abroad, are a step in the right direction.

Even though a focal exhaustion in the parts convulsed succeeds the fit, still in the vast majority of such cases operation is contra-

indicated, as the disease may be one of grand mal epilepsy, but masquerading as a focal epilepsy. We now know that at least two to four per cent of idiopathic epileptics have Jacksonian attacks or a definite order of muscular march in the fit. This fact is exquisitely seen in serial or status epilepsy. The following case is a typical instance in point. The judicious use of bromides not only frequently lessened the paroxysmal fury of the fit, but often prevented a destructive status. The case is given here in abstract.

CASE I.—J. A., a young man of 20, suffering from grand mal epilepsy. He had Jacksonian attacks in serial or status first in one part of the body and then in another part. While under my observation he had five distinct status periods of this sort. (See charts 1 and 2.)¹ In addition to these

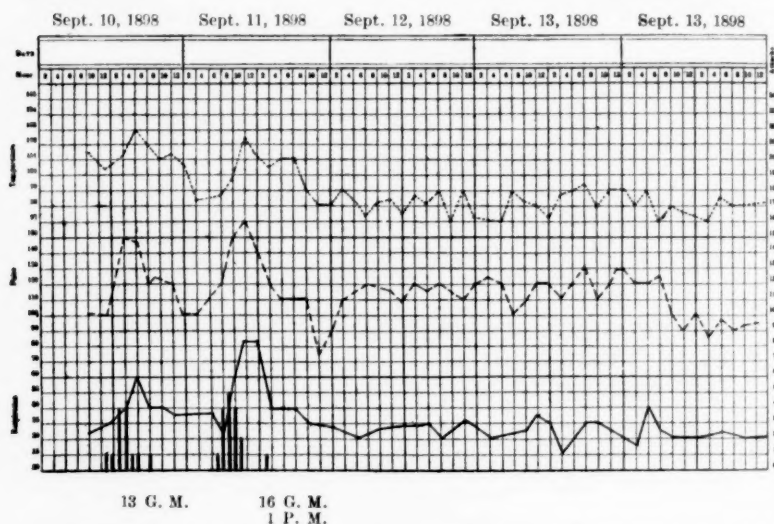


CHART I.—J. A. Status Epilepticus of an idiopathic epileptic in which there was a focal onset of the fit during the status only. The record is fairly typical of a mild period of status.

¹ Explanation of Clinical Charts: The general scheme is to show the alterations and relationship subsisting between the fever, pulse, and respiratory curves in the illustrative cases of status epilepticus. The changes in the three curves were noted in periods of two hours. The curves take their reading standard from the left as in ordinary fever charts. The hourly record of epileptic attacks is represented by solid columns; their reading standard is at the right of the chart. The columns are prolonged to the base line of the chart in order to aid the eye in following the record to advantage. The letters G and P indicate the grand mal or petit mal nature of the fit, respectively.

interesting clinical details, during the status in 1899 the patient was especially studied for dermographism. Observation on March 4th, at 4.30 p. m. Tache Cerebrale: No. 1—Streak made in convulsion only red after all spasm had passed. No. 2—Red streak made before fit did not change in the spasm nor afterwards. No. 3—Red streaks long before fit, long after turned white, remaining white for some time. No. 4—Tache cerebrale after fits passed showed as usual.

On March 5th, in the period of greatest exhaustion, the streaks remained the entire day. On the 8th, during convalescence, marks remained only for two hours. The secondary recurrence of the streak was shown in two-thirds of a circle on the abdomen, disappearing after two hours, but it appeared again two hours thereafter. March 9th, marks only partially visible for an hour after production. On the 10th they lasted but thirty minutes. Curiously, the streaks made the evening before became in part

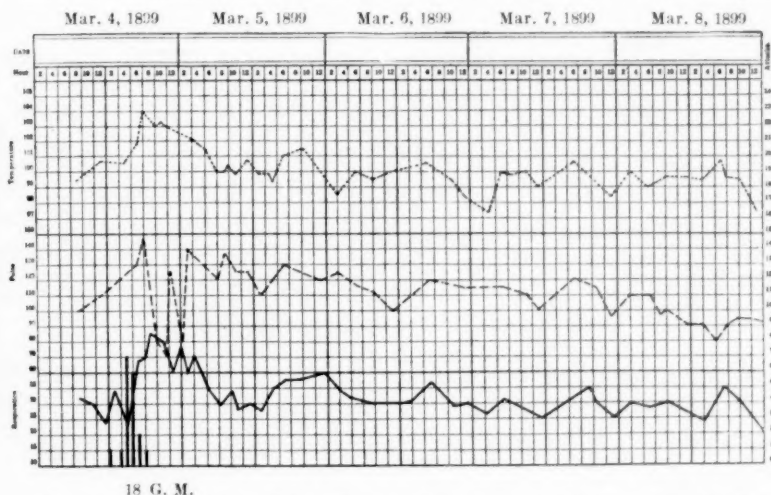


CHART II.—J. A. (cont'd). Shows also a status period composed of but eighteen Jacksonian attacks in which there was great vaso-motor derangement shown in dermographism described in the case history. Note the disparity between temperature and pulse curves on March 4th caused by incipient circulatory collapse.

visible on the morning of the 11th, and gradually became plainer until noon, when they slowly faded and disappeared entirely at 3 p. m. On the 13th, streaks disappeared as in the normal state, but reappeared partly though faintly two and one-half hours thereafter.

The phenomenon of disappearance and reappearance of the tache I have never observed except in great exhaustion of true status of idiopathic epilepsy—that it is not dependent upon local peripheral exhaustion is shown in that it is not more marked in parts most convulsed.

Focal or Jacksonian status never alters its line of muscular march, as seen here. A desultoriness of cortical discharges in irregular and inconstant types of fits shown most intensively in status periods bespeaks an idiopathic type of epilepsy as here presented. In the interstatus periods the epileptic attacks in the above case again become classic grand mal.

Cases of status showing unusual violence and extreme locomotive unrest are as rare in status elepticus as common in status hystericus. Status elepticus partaking of such characteristics is often confusing to the inexperienced observer and is many times classed as hysteria. However true it may be that isolated attacks of hysteria major and certain fits of epilepsy cannot be differentiated on convulsive grounds, the status condition of the two affections presents no such difficulties, as we can depend upon the pathognomic difference of the so-called cardinal curves of pulse, fever, and respiratory changes.

The following case of unusual locomotive status presents one period of *etat de mal* passage (Bourneville). By some clinicians it might be classed as an ordinary serial period or a mild status. There can, however, be no doubt of the status nature of the period in March, 1899, reproduced here; it was typical and classic throughout and followed by recovery. A summary of the case is as follows:

CASE II.—E. C. M., a young man of 24, who had been epileptic since three years of age. At 21 the patient's attacks were all grand mal in type, attended by extreme muscular contractions at their inception, the initial spasm frequently causing the patient to turn a complete somersault. There was an aura of extreme pain in both calves of the legs about ten seconds before the seizures. Almost always the patient assumes a convulsed, knotted-ball appearance. He rolls over and over, usually forward, three or four times before being released from the first tonic onset of the fit. The wild yells, partly from the aura pain in the calves and partly being the usual character of the epileptic cry or series of cries, attended by horrible facial grimacing with which this contorted human ball begins the epileptic fit, furnished a truly distressing scene. For some time the state was diagnosticated as a hysteric episode or a maniacal equivalent, but placed under close study the epileptic character of ordinary type was proven. In either isolated paroxysms in serial or status periods the patient kept to the same general character of the attacks as heretofore outlined. In the status periods the floor and sides of the ward room were padded with mattresses to reduce the chances of self-inflicted injury. Notwithstanding all precautions taken, after each status period the patient was one mass of bruises, which required weeks for recovery. Chloroform inhalation followed by enemas of chloral and bromide controlled all attacks of status until the period of July, 1901,

in which the patient died. Post-delirium, at times amounting to delirious mani of the exhaustive type, always followed the severer status. The patient had a postmortem rise of temperature. See charts 3 and 4.

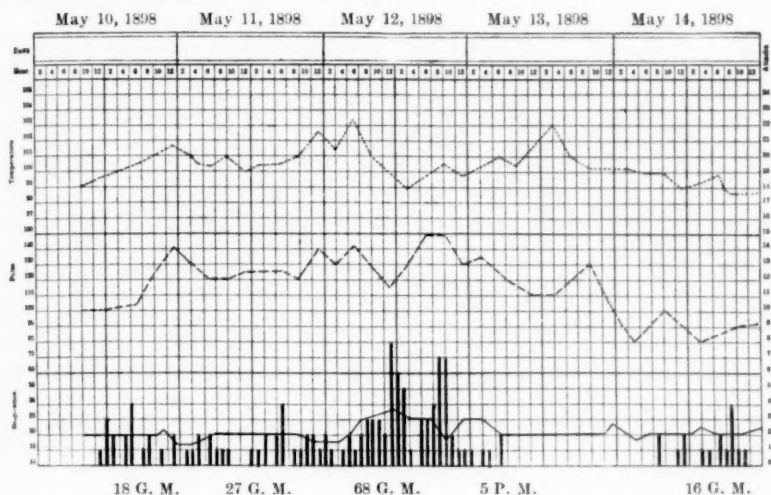


CHART III.—E. C. M. Grand mal status composed of fits of extraordinary locomotive unrest. Notwithstanding the severity of attacks, 44 fits occurring in two days, the patient did not fully enter the status until the third day of the period.

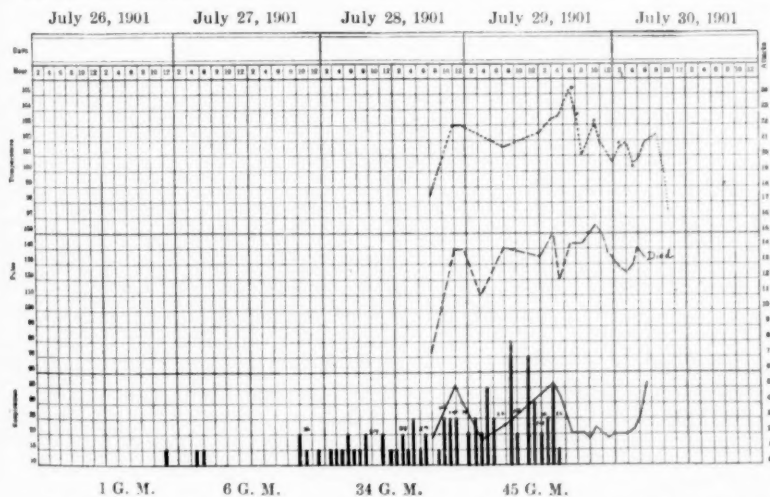


CHART IV.—E. C. M. (cont'd). Terminal fatal status. Note gradual increasing number of attacks for three days before circulatory exhaustion and fever were shown. Chloroform was ineffectual in aborting status. Patient had a unique postmortem rise of temperature of 1° , registered two hours after death, more than 14 hours after the end of the convulsive period of the status. Death was attended by pulmonary cedema.

It is ordinarily held by epileptologists that it is impossible for epileptic paroxysms to occur in the course of infectious diseases, as the fever acts as an equivalent of the fit or acts to inhibit the cerebral discharge. However, this view is not entirely true,³ as isolated paroxysms may occur in the course of any infectious process, although the liability of this occurrence is greatly reduced. The following case is given in brief as an instance of fatal status occurring in the course of German measles. The autopsy may be considered as a contribution to the vexed question of congenital narrowing of the aorta, premature arteriosclerosis and mental defects.

CASE III.—Lena D., an epileptic idiot girl of 15, having convulsions since one year of age. A peculiar vaso-motor phenomenon attended the seizures; after each attack, grand mal in type, a diffuse macular rash or redness appeared around the neck, on the inner and posterior aspects of the arms, and on the lateral aspects of the chest. The face was cyanosed, but the hands and feet were of the deep purple color typical of erythromelalgia, but without pain. During stertor following fit the deep cyanosis would gradually disappear. There never was any heat or swelling or tenderness in the parts. At another time (May 18, 1899) the areas of redness were not palpable, but had a well-defined but sharp border and disappeared on pressure. In ten minutes the redness began to fade and entirely disappeared from small areas on the chest, leaving mottled spots of greater or less extent with irregular borders; that is, the redness did not disappear from the outer border inward, but continued to cover original areas as long as the phenomenon was noticed. The spots finally disappeared in about fifteen minutes, leaving no trace of their former presence. For several hours the hands and feet remained a dark purple and slowly became pale and cyanotic in eight to ten hours. The condition was undoubtedly an exhibition of cerebral vaso-motor discharge of the epilepsy, and the redness disappeared as the peripheral vascular apparatus recovered from the exhaustion and gained its lost tone.

The patient contracted measles on April 22, 1900, the period of incubation being about 14 days. The invasion began with a cough and coryza, and the temperature rose rapidly at the onset. The patient was weak and seemed to suffer severely from the disease. The eruption came out on the second day and spread quickly over the entire body, but was less pronounced in character than in other cases. On the fourth day the rash became more distinct, but it still was not well pronounced. The rash was irregular, reddish blotches, while the skin was cyanotic between the rash spots. The peripheral circulation was extremely poor from the start. The skin was cold and clammy throughout the measles. The temperature began at 100° F. and

³ "Epilepsy and Infectious Diseases," Clark-Sharp, Med. News, Oct. 1, 1900.

increased to 105° F. on the third day, continuing high, with slight remissions for a few hours at a time, until death on the sixth day. The respiration and pulse increased from the start; the pulse rate was very feeble throughout and ranged to 160. Patient had suffered from pulmonary tuberculosis for some time and died of status epilepticus. (See charts 5 and 6.) The treatment was

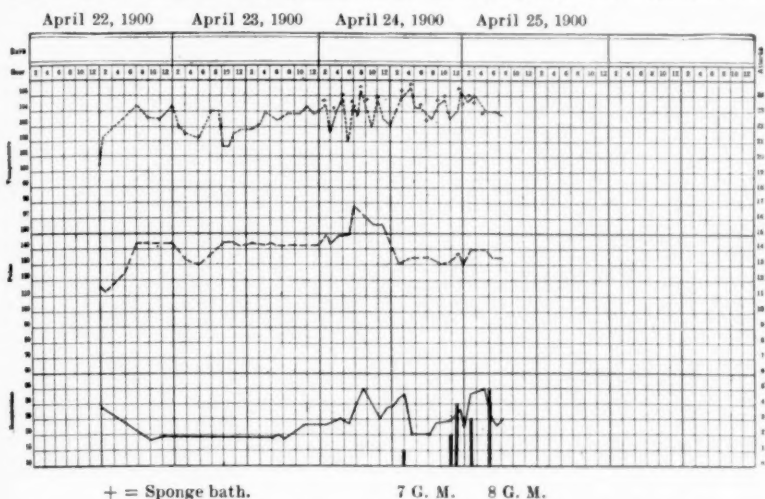


CHART V.—Lena D. An idiopathic epileptic showing the febrile movement of German measles during the course of which a fatal status was precipitated. Death occurred during the second convulsive period after a two days' freedom from fits. The latter was probably induced by the bromide sedation, the entire withdrawal of which, after the attacks were controlled, apparently permitted the renewal of the status.

April 27, 1900

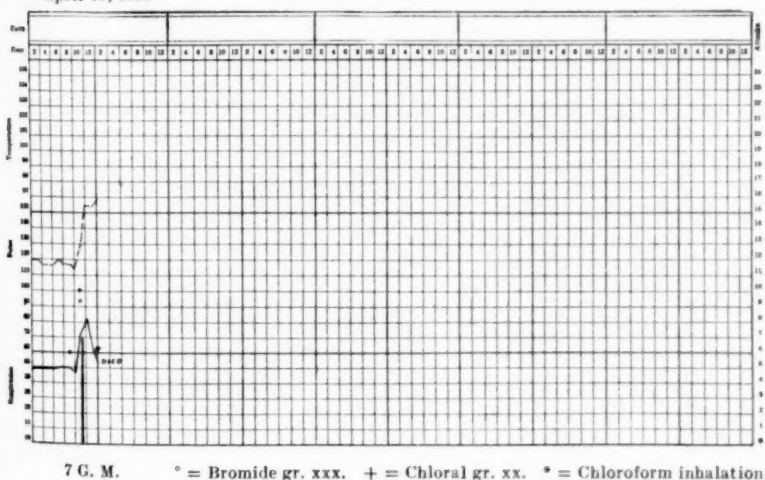


CHART VI.—Continuation of Chart V of the same case.

by isolation, confinement in bed, liquid diet, cardiac stimulation, morphine and potassium bromide during status.

The patient entered status epilepticus while in the febrile state and died from exhaustion April 20, 1900. (See charts.) Autopsy revealed the left lung and pleura studded with miliary tuberculosis; the heart was small; many arteromatous plaques were found in the aorta which also narrowed to the size of the tip of the little finger.

Particular attention is called to the exhaustion paralysis phenomenon in the following case, which not only occurred in an idiopathic epileptic, but the phenomenon itself was very anomalous, in so far as the arm center of the right brain and the leg center of the left brain were discharging areas, and therefore these cortical areas are the exhausted centers as demonstrated in the paralysis. The absence of macroscopic brain lesions in status and in the exhaustion-paralysis cases is nowhere better demonstrated than in this case. From the nature of the case we would expect exhaustion lesions in the motor centers of the cortex, and that is exactly what was found in the chromatolysis of the motor region, being especially well marked in that part of the brain. But the main lesion of status is no mere phenomenon of exhaustion manifested locally, but a widely spread and comprehensive cortical degeneration of the entire brain, as shown in the pathological study of this case.

CASE IV.—Walter S., a colored boy of 20, who had been epileptic since 10 years of age. All the patient's attacks were sudden and violent; successive physiologic groups of muscles were involved in the tonic stage and gave the patient the appearance of performing semi-purposeful movements as in hysteria. Consciousness, which was always lost as soon as the first muscular spasm ensued, returned at once on cessation of the spasm, if no more than eight or ten attacks occurred daily. In the spasms the tonic state of muscular rigidity predominated. A few times he had an aura which was invariably a sharp pain in the wrist.

During the subsequent year the character of his attacks changed and remained constant without variation to this new order. (He had 2,500 attacks during the year.) Tonic spasms began at once in all the muscles of the left arm, then crossed and passed to the right leg, and finally began simultaneously in the left leg and right arm. Spasms lasted but a few seconds and were never clonic, even in series. Slight paralysis was found after all these single attacks; whenever a series of eight or ten occurred in 24 hours marked palsy was noticed; it was always in the left arm and right leg, most marked in the left arm. Two attacks of status epilepticus during the year rendered the left arm and right leg hemiplegic for several days. The right knee and left wrist-jerks became permanently exaggerated.

Patient died in status epilepticus on August 27, 1898, from exhaustion, after 74 seizures, the same as heretofore described, occurring in twelve hours. (See chart 7.) Autopsy showed no gross lesion in the brain or cord to explain local exhaustive phenomena. The microscopical findings are as follows:

The material had been soaking for several weeks in alcohol 95 per cent and was rather soft. As a consequence the cells of the cortex stained irregularly and diffusely. There were evidences of marked chromatolysis throughout the cortex. The cells of the second layer were diminished in number. The nuclei of the cells of the second and third layers often appear swollen and

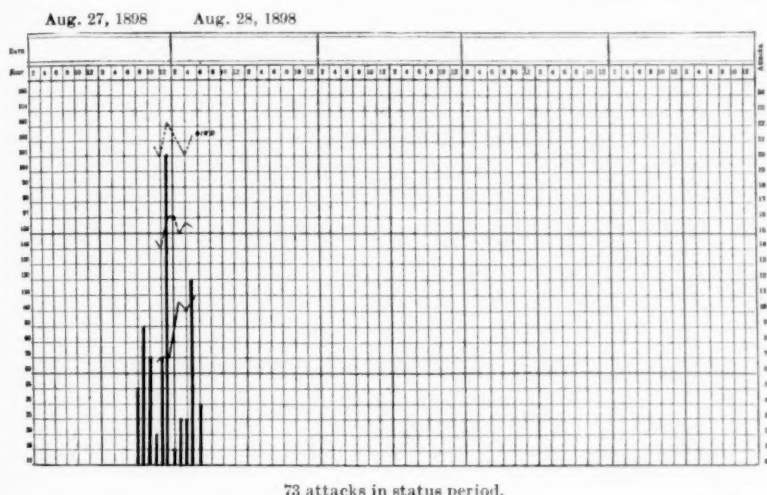


CHART VII.—W. S. Shows an acute fatal status in an apparently idiopathic epileptic. Death occurred by exhaustion in the remarkably short period of twelve hours of status.

granular and are poorly outlined. There were many examples of displaced and completely abstracted nucleoli. There were some evidences of post-mortem changes. Neuroglia not stained.

A case of typical grand mal idiopathic status which was precipitated in greater part by extensive burns, and was apparently unmodified by any form of treatment given, is rendered here as a contribution to the peripheral causation of status; an analogue to the peripheral theory of the causation of isolated fits of epilepsy is here presented, as shown in the preceding case. Possibly also there is an "intangible" status as well as in epilepsy proper, which, in pathological terms, means the preponderance of the epileptic lesion beyond remedial modification. The climax of

status is irresistible when once inaugurated in some epilepsies. The case presents other interesting phases of epilepsy in the nature of the equivalents. The case notes, in brief, are as follows:

CASE V.—W. H. S., a young man of 18, who had been epileptic eight years. He had frequent attacks of epistaxis (epileptic equivalents) since his epilepsy began, appearing independent of convulsive seizures and apparently replacing them. He always had disordered sleep and "night terrors." Just before admission, he had paroxysmal hallucinations of sight at night (epileptic equivalents). Frequently while in bed he awakened suddenly and had numerous and repeated sensations of falling. These sen-

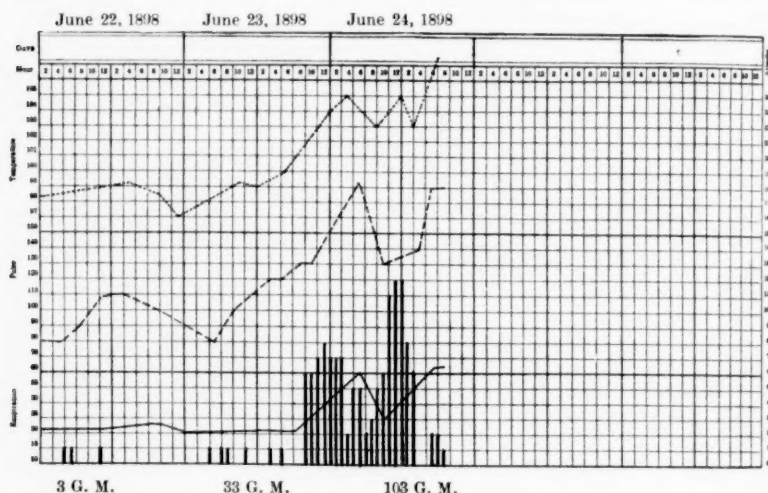


CHART VIII.—W. H. S. Shows a typical case of acute fatal status in an idiopathic epileptic. The status was precipitated by extensive burns. Death occurred by exhaustion in the convulsive period.

sations occurred every few minutes and lasted but two or three seconds (probably petit mal attacks or sensory equivalents).

His right hand and leg were most frequently affected first in grand mal attacks, and these seizures usually occurred weekly in series of four or five. June 9th, 1898, he sustained severe burns over nearly the whole anterior aspect of the chest, as a result of a severe attack. Several hours later grave status set in, from which he died at 10.30 p. m. June 24th. (See chart 8.)

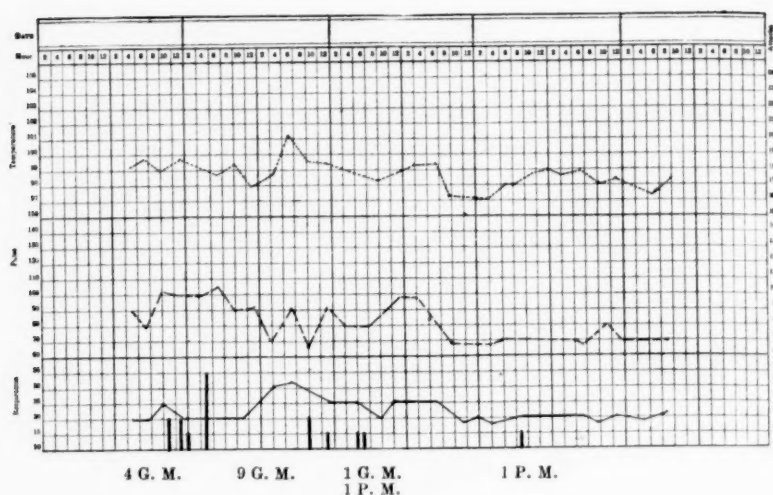
There are those who maintain that all epilepsies in which serial periods occur, and after which periods a post-exhaustive paralysis results, are essentially epilepsies following slight infantile cerebral palsy. Much study of the post-paroxysmal ex-

haustion phenomena forces us to conclude that this position is in the main correct and all cases of post-paroxysmal exhaustion should be held decidedly under suspicion as having an organic basis or cause, until the contrary is proven. However, there are undoubtedly pure exhaustion cases of idiopathic epilepsies, especially in the grand mal type, masquerading as Jacksonian fits in type, that have an order of invasion and a right or left side predominance of convulsions and exhaustion. Again, we occasionally see cases that by the most careful study fail to show to which of the two classes they belong. The following case in which many serial periods and possibly one or two mild status periods have occurred, followed by exhaustion paralysis, is one of the doubtful sort. Nevertheless, in most of the doubtful cases the remnant-symptoms of an early cerebral palsy are usually entirely absent; if such symptoms should be found to exist in any degree, the case in the presence of post-paroxysmal exhaustion phenomena should be classed in the epilepsies with an organic basis. The doubtful case under our study is as follows:

CASE VI.—J. K., a boy of 14, epileptic three years. About two years before coming under observation patient had post-paroxysmal paralysis of the left arm, "and nowhere else, which lasted two weeks." A history of serial attacks was given, as many as ten in 24 hours being reported. Frequent reports of 20 grand mal seizures have been made since admission. Physical examination rules out even the suspicion of an early palsy lesion. On April 2d the most marked serial (or mild status) period prevailed, as shown by chart. Slight local transitory (exhaustion) paralysis followed this state for one week. The condition was confined entirely to the left leg, the parts first and most convulsed in the period. (See charts 9 and 10.)

While it is usually held that status embraces the two essential symptoms, convulsions and fever, one or the other may be absent, just as the convulsion or loss of consciousness in isolated attacks of epilepsy may be absent. Illustrative cases of both irregular phases of status will be embraced in this study.

It is the rule for status epilepticus unilateralis to present less fever if composed of mild attacks of status, yet in the fatal periods of status of Jacksonian epilepsy the range of fever curve is marked and is very significant of the severity of the exhaustion. A decided rise indicates an unfavorable termination. An entire absence of fever in fatal status epilepticus unilateralis is rare indeed. In previous status periods in the case about to be detailed,



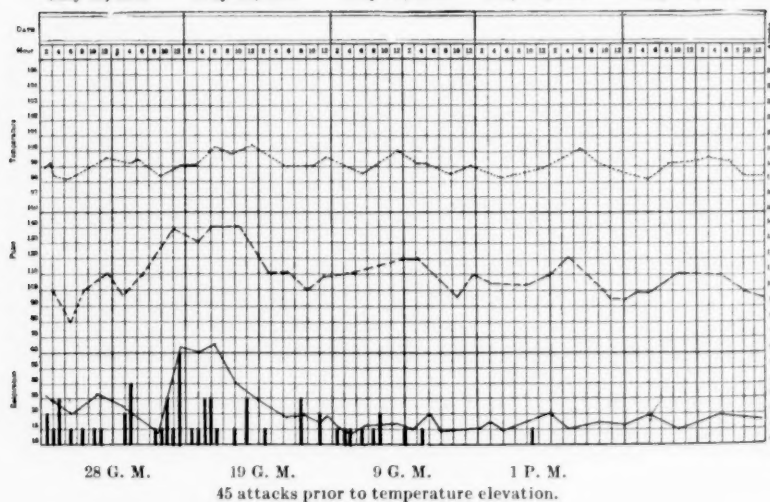
July 15, 1898

July 16, 1898

July 17, 1898

July 18, 1898

July 19, 1898



CHARTS IX AND X—J. K. Show mild status periods in an idiopathic epileptic with focal onset of fits. Note the slight alteration in the cardinal curves in spite of a large number of attacks.

notably the periods of March 11, 12 and 13, there was also no temperature. Brief notes of the case, with microscopical findings, are as follows:

CASE VII.—Raymond W., young man, age 21; an imbecile, hemiplegic, and epileptic. His attacks began at four months of age after an infantile cerebral hemiplegia of the left side. A neuropathic family history exists. Patient was much emaciated from phthisis on admission November 4, 1897. His attacks were grand mal and petit mal, with a left side order of invasion; occasionally the mild attacks were confined entirely to the left side. Progressive emaciation and status finally caused death on April 3d, 1900, *without temperature*. Autopsy held four hours after death showed marked atrophy of the brain, but there were no marked damages in the brain or its membranes. A miliary form of general tuberculosis was found in the lungs. The microscopical findings in the brain were as follows:

There was very decided chromatolysis, some of the cells being reduced to ragged masses of protoplasm, presenting no nucleus or nucleolus. This was especially marked in groups of cells in the third layer. In very many of the cells the nucleus was very granular, and in not a few instances it was also deeply stained and poorly outlined. Numerous examples of nuclear abstraction were found. The cortex was extensively invaded with leucocytes. The cells presented some evidences of postmortem change. The neuroglia was not stained.

Another illustrative status of grand mal idiopathic epilepsy, apparently masquerading as a Jacksonian type of epilepsy, is here presented. In the isolated paroxysms of the patient's epileptic career the attacks were never with focal onset. If the fits had been classic, of sudden and general onset, probably death could not have been so long postponed. Again, we see in this case that the character of the fits change from classic convulsions, simultaneous in all parts of the body, to that of a Jacksonian order of muscular march after the status had become well inaugurated. The case would, therefore, seem to disprove the conclusions of a number of observers that focal attacks, or those fits in which an order of muscular invasion is shown, that status composed of such fits is something more than a true climax of epilepsy. It has been contended that they are of an apoplectic or embolic origin. It is difficult to view our case in this light. There was no evidence of the super-addition of a new lesion at the end of the last grand mal classic attack, the 37th, and the beginning of the new kind of fit that finally terminated the patient's life in the 557th. It is more rational to suppose that, after the cortical centers meet with a certain degree of general exhaustion, certain centers are less active in the epileptic discharge and that other more irritable centers take the initiative in the fit and "persuade the former fairly stable adjacent centers to co-operate with them in the fit";

an essential theory of Hughlings Jackson to explain certain types of focal fits and their manner of spreading to general attacks. Von Monakow's diaschisis theory might here find an anatomico-physiological application still more apt to explain clinical facts. The notes of the case are as follows:

CASE VIII.—Jennie M., a girl, 22; epileptic since early infancy. She died from collapse in a typical status of 557 seizures. The last 519 were characterized by a distinct and leisurely order of invasion, beginning in the right hand. On the night of July 31st, when she was seen to be in a status period, she was given the emergency prescription, which was effective, and she had no more seizures until 6:40 a. m. August 1st, a period of nearly six hours. At that hour they recurred, and at 8:20 a. m. she had 17 more. Another dose of the same medicine was given and there were no more seizures until 4.25 p. m. At that time they recurred, when, for the third time, the special medicine was given. This time it was not effective.

While chloroform was constantly administered the right side only participated in the convulsion; but when not under the chloroform the contractions, after attacking the right side, passed rapidly to and involved the entire left side in a quick general spasm.

Her temperature rose rapidly after the 200th seizure to 104° F., 105°, and finally 106° F. She became continuously unconscious and was unable to take any nourishment; the entire body was bathed in profuse perspiration, so that it was necessary to change the clothing every two hours. Her face became blue, cyanotic; breathing labored and stertorous; hands and feet were cold, and the force of the contractions themselves became progressively less severe. The brain was removed four hours after death. On inspection nothing abnormal was found, not even the blood vessels of the coverings being engorged to any extent; in fact, the superficial aspect of the entire brain, as to color, was rather pale. Naturally, the opposite was expected. The specimen was not properly preserved, and therefore its value for pathological study was lost.

The following case is given as a study in certain symptoms-complex occurring in epilepsy, as an equivalent or analogue of the status epilepticus.

Undoubtedly much evidence is still wanting to prove many other alleged epileptic equivalents, but anyone devoting a few years to the careful study of the epileptic state cannot help being impressed on seeing an epileptic, accustomed to serial attacks of petit mal, suddenly have a stupor (somnolence), passing days or weeks in a continuous stuporous stage without any cause. Status somnolence is fairly frequent in this case; at times the state carries the patient very near death by exhaustion. Without apparent cause

or premonition the patient slowly sinks into a stuporous state, attended by coma and extreme prostration. The history of the case will largely be arranged in the chronological order.

CASE IX.—W. H. J., a man of 22; epileptic since 15 years of age. A history of attacks of somnolence was obtained from the family. Patient had the usual mental enfeeblement and peculiarities of a chronic epileptic. The physical examination showed nothing abnormal. Soon after admission, on February 13th, 1896, the patient had a mild attack of somnolence and stupor, independent of epileptic convulsions. As he had been taking potassium bromide grains XXX, t. i. d. for two weeks, it was thought the stupor state was due to the unfavorable effects of the bromide; but while taking a sedative medicine, on September 29th he had an attack of stupor or somnolence which lasted seven days. During this time the pulse increased to 160 and respiration to 34, but the temperature was subnormal; the greater part of the time it was from 97 to 97.5. March, 1897, the patient was in stupor again for 36 hours. The attack was ushered in by a sudden somnolence. Patient had but one-half as many convulsions for the month before and the month after this stupor, as compared with the previous months in which no attacks of somnolence occurred.

September 18th, 1897, patient passed into a period of stupor which lasted one week. No seizures immediately preceded this state, although some isolated attacks occurred independently the week after. On November 11th, 1897, the patient recovered from a stupor lasting 24 hours, was active for eight hours, and again passed into a profound stupor which lasted for three weeks. No convulsions occurred for four days before the stupor period nor after it until December 24th. The patient had recovered from the stupor about eight days before the convulsions reappeared. Physical and mental exhaustion and emaciation were extreme, and bed-sores formed on the buttocks, elbows and heels. During 1898 he had but one slight stuporous attack until December 22d, when he had 16 grand mal attacks, followed by temperature and pulse elevation, and persistent prolonged stupor. This was his most severe attack of stupor, lasting nearly three weeks, and, as it is rather typical of all the foregoing periods, it will be given at length for illustration. (See chart 11.)

December 21st patient had eleven severe convulsions, but was up in a few hours thereafter, and appeared as well as usual until the 22d, when he became comatose. His bowels moved involuntarily twice, but it was necessary to catheterize him. As the coma occurred 36 hours after the seizures had ceased, and all effects from them had passed, as will be seen from the chart, it seems best to speak of the coma as independent of the convulsions. Edes might have called this a postponed exhaustion, but the relationship of the two phenomena is too distant for such an explanation. Patient remained in stupor during the 23d, and no convulsions occurred. On the 24th there was a slight epistaxis. Ten ounces of urine were taken by catheter. He was induced to take a little nourishment. On December

25th he could not be aroused, but remained in the trance state. Bed sores formed and patient underwent rapid emaciation; he had the odor of those patients undergoing rapid dissolution. The urine was scanty, highly colored, and at times bloody. His condition remained unchanged until mid-night January 1st, 1899, when he had two severe attacks, after which the stupor stage was omitted, and the patient became much brighter. During the day of January 2 he had four attacks, and each one was attended by his usual interparoxysmal activity and cheerfulness, instead of depression. During the night of the 2d he had nine severe seizures, none of them being followed by depression. On January 3d he continued to show marked physical and mental improvement, although he had seven grand mal attacks. Without having any more seizures he continued to improve steadily, and

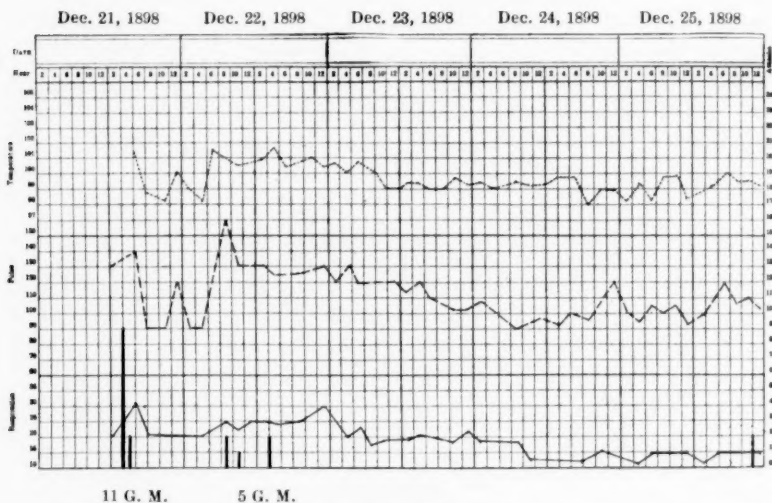
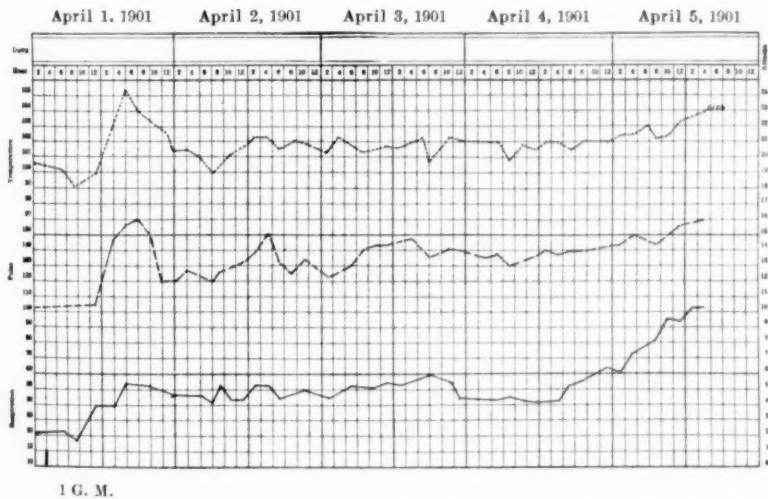
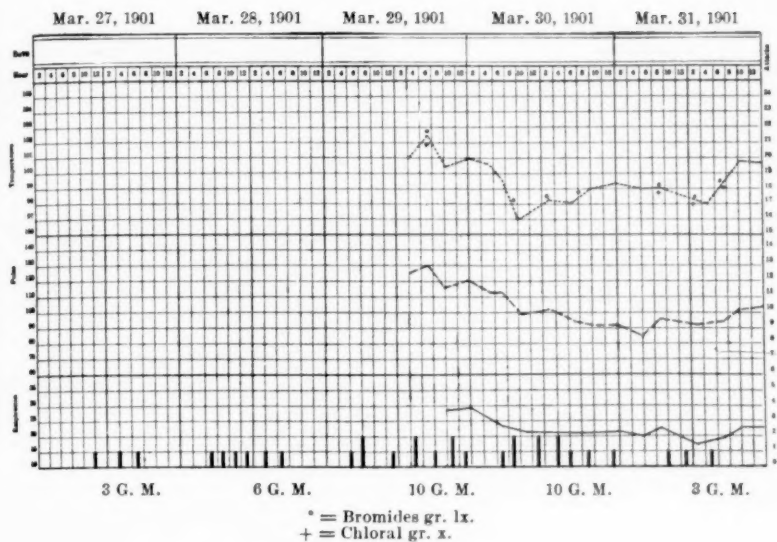


CHART XI—Wm. H. J. Showing the somnolent equivalent of status epilepticus (status somnolence) or an inverted status. See text for a detailed analysis of the entire chart period.

was discharged from care in the observation ward on the 19th, having recovered from his mental and physical prostration. It might seem reasonable to look upon this case as one of *inverted status*. The fatal status of this patient was relatively more severe, but was otherwise similar to the previous stuporous periods, as noted in his charts. Although more seizures occurred just before this fatal stupor, yet a persistent somnolence lasting three weeks antedated the whole picture. (See charts 12 and 13.)

Autopsy one hour after death showed the following: Chest.—Middle lobe, right side was firmly adherent to lateral and posterior chest wall; the upper left lobe had areas of miliary tuberculosis. There were no adhesions of the left pleura. Pus and blood oozed on pressure. The heart was



CHARTS XII AND XIII.—Final fatal status (somnolence) of the same case, Wm. H. J. Note the extraordinary rise in cardinal curves in record of April 1st, 1901, after but a single fit occurring twelve hours before. The chart is quite like that ordinarily seen in status, but here the seizures are absent, a state of somnolence taking its place.

small; the right ventricle was firmly contracted; the endocardium was normal; the valves were also normal; a postmortem clot was found in the right ventricle. The gall bladder was distended. Quadrate lobe of liver arched over the lip of peritoneum. The liver substance was firm, but had a fatty appearance. The spleen was slightly enlarged, but the tissue was normal. No peritoneal fat was found around the kidneys. There was some tendency to lobulation in both organs.

Brain.—The skull cap thickened anteriorly, otherwise it was normal. There was no evidence of alleged former fracture. The dura at sight of pachionian bodies on right side was quite adherent, causing some laceration of pia and brain on removal. There was atrophy of posterior of right motor region. The pia was adherent over atrophic areas. There were small cysts in both lateral ventricles, being larger on the right side.

The following status case presents the phenomenon of one convulsion forming the entire convulsive period, making a seizure of practically forty-five minutes in duration.

CASE X.—Joseph S. M.; male; aged 13. His epilepsy began when he was six months of age, at the time of dentition. The patient is the fifth child in a family of five. A paternal aunt died of phthisis; his father had curvature of the spine and died of spinal meningitis; he was also somewhat demented before his death. A paternal uncle was insane. Two of the patient's brothers had convulsions at dentition. During infancy the patient had several attacks of indigestion, and these were always attended by convulsions. The patient's mother had three sisters who suffered from sick headache and "neuralgic attacks." In early infancy the patient frequently suffered from night terrors and disordered sleep. The attacks at first most frequently involved the left side. The early onset of the patient's epilepsy has materially interfered with his mental development.

On March 19, 1898, the patient had been in a continuous spasm for twenty minutes prior to the physician being called. This condition continued, although the ordinary means were used to stop the seizure. At the end of about forty minutes of the continuous clonic movements the patient's temperature registered 103° F., although he had begun in a condition of ordinary health. At the end of the forty minutes inhalations of chloroform were given. About five minutes later, at the completion of the forty-five minute period, the convulsions had almost entirely ceased and very soon ceased altogether. The patient had passed into a condition of coma. The pulse rate was 146 and the temperature remained high. Extreme and profuse perspiration had resulted. The patient remained in a comatose condition, unable to be aroused, for thirty-six hours thereafter, the temperature gradually returned to normal at the end of forty-eight hours. The patient remained mentally confused for two or three days.

August 3d, 1898, patient had two severe attacks, one lasting fifteen minutes and followed shortly by another lasting forty minutes and consisting of clonic spasm of the right arm and right side of the face. Details are as follows:

August 4th, at 11:30 a. m., patient began a convulsion which was most marked on the right side. This lasted fifteen minutes, during which time the muscles of the right side kept up a continuous clonic spasm, while those of the left side were in a clonic spasm for short periods during this time. An interval of fifty minutes elapsed, during which time he regained some degree of consciousness, but then passed into another similar convulsion. The eyes rolled to the right, the right corner of the mouth kept up a clonic twitching, and the right arm and leg again presented a clonic movement. This was maintained for forty minutes without ceasing. The muscles of the left arm and leg were occasionally convulsed; but the clonic spasm did not continue as on the right side. Following the latter attack he lay in a comatose condition for twenty-four hours, and at the end of that time he became gradually conscious of his condition, but was too greatly depressed to get up. He remained in bed for two days and then fully convalesced in one week. Temperature 103° F., pulse 140, respiration 32 at the height of the status period.

Aside from the three prolonged attacks of continuous clonic convulsions, the attacks have been regular grand mal and petit mal, and occur about ten per month, mostly diurnal. From an etiopathological standpoint the case is a pure idiopathic, entirely devoid of any symptoms or history of infantile cerebral palsy or any other organic lesion as a basis.

The next case is also one having frequent periods of status epilepticus unilateralis. The status is at times made up of one continuous convulsion in which intensity varies at regular periods, but between such phases of intensity the convulsions never entirely cease. At other times the slight convulsions between the intense phases of muscular spasm are so slight as to be hardly observable, yet they are none the less present on close observation. This case and the preceding one differ, in that the latter is dependent upon a definite infantile hemiplegia. The clinical manifestations in convulsions are, however, not so very dissimilar.

CASE XI.—Joseph K., a boy of 13, who had been epileptic since 18 months of age, following right infantile cerebral hemiplegia. Patient had from the beginning many serial and status periods.

Patient falls in an attack, after the tonic rigidity of the first stage is passed instead of the general clonic movement usually observed in grand mal; the right face, right arm and right leg, in the order given, persist in clonic spasm, while the remainder of the body becomes flaccid. The intensity and persistency of the clonic spasm is in the above-named order. After a variable period of ten to forty minutes, according to whether antispasmodic and sedative remedies are used, the clonic spasm ceased in the inverse order of onset. In exceptionally severe and prolonged attacks, and especially where anæsthetics are not used for immediate control of the

seizures, the attacks become general, although the right face and arm are always most engaged in the convulsion. As might be expected, local exhaustion phenomena are superimposed upon the organic paralysis and for a few days it materially hinders the patient's getting about. In mild attacks the temperature is from one-half to two degrees higher on the convulsed side. If the convulsion is prolonged to any great extent fever develops and lasts for a few days. Each of the periods is a more or less accurate epitome of status. The case resembles that of Case VIII, an idiopathic grand mal epileptic, but in which the subintractant and imbricated attacks occurred only at rare intervals.

Fig. 3, of a period of status, is of interest as showing the hemispasm in the right arm and right side of the face and neck, while fig. 4, taken just at the moment of muscular relaxation in the arm, shows the spasm starting in again for the next fit at the right corner of the mouth.

An observation on the difference of bodily temperature of the two sides of the body as compared with that of the rectal temperature is well shown in the status period of March 14th, 1901. After convulsing for forty minutes the temperature in the right axilla was 102° F.; left, 101.7° F.; by rectum, 103.1° F. Three thermometers were employed simultaneously a half hour after the convulsion had stopped under the administration of chloroform. The temperature was as follows: Right axilla, 99.7° F.; left, 99.1° F.; rectum, 100.8° F. At other times, when the convulsions have not been very intense nor prolonged, as in the status shown in the figures, the temperature of the right and left sides was not so disproportionate. Two or three thermometers need to be used simultaneously (in spite of the fact that they may register differently), as one or more seizures may occur between the taking of the temperature of the two sides.

The temperature records here are an interesting contribution to the theory that the muscular spasm itself is largely responsible for the heat production in the fever of status, else how may one explain the excess of temperature on the side most convulsed?

The following case is one of alternating status unilateralis in an hemiplegic epileptic. During the years 1899 and 1900 patient had as many as a dozen status periods, which were best controlled by chloroform inhalations. For the year 1900 the majority of her paroxysms were of the status nature, isolated typical seizures rarely occurring. Usually the status unilateralis consisted of one prolonged clonic convulsion of the left side (hemiplegic). When the right side alternated with the left in the convulsion the left was most convulsed. Exhaustion-paralysis was always a transient accompaniment of the status. The prolonged incessant clonic spasm in this case, showing a rhythm of intensity, is best accounted for on the basis of isolated attacks occurring so frequently as to make an imbrication or overlapping of single

epileptic discharges. Although the exhaustion is great, as indicated by the symptoms attending, yet they are far from being fatal, as the true grand mal status.

CASE XII.—Mattie F., a girl of 16, epileptic since seven months of age, dating from an infantile cerebral palsy of left side. The convulsion generalizes from the left or hemiplegic side and becomes general for one-fourth to one-half a minute; the thumbs are flexed on the palms and the knees are flexed on the body and widely extended; the breathing is stertorous and not loud, but the patient froths at the mouth profusely, clonic spasm continued on the left side for about one minute, *then changed to the*

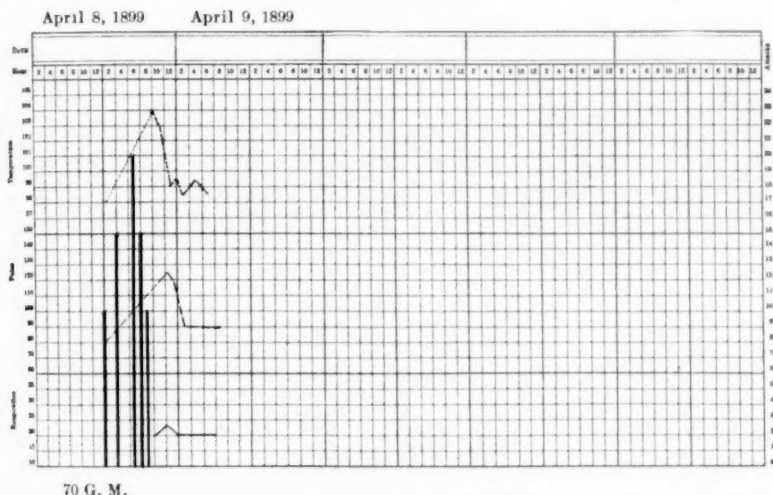


CHART XIIIa.—M. F. Shows an aborted alternating status unilateralis. See text for full description of the unique character of attacks.

right side and continued to alternate in this manner for the remainder of the status period, constituting an alternating status unilateralis. (See chart 13a.) The alternation occurs about once in six status periods. There is a sort of periodicity or rhythm of the continuous clonic convulsions, an exacerbation every two or three minutes. Patient never ceases entirely from convulsions from start to finish. Convulsions were existent for a period of one hour and forty minutes on April 8th, as indicated in the graphic chart. There was profuse perspiration over the whole body, equally prominent on both sides, but was most profuse on the face, breast, and hands. As the patient became more exhausted, there was a shorter interval between the exacerbations of the attack. There was marked paleness around the nose and mouth, and total unconsciousness, deepening into profound coma, depending entirely upon the length of the period. The patient recovered in a few hours, but the left side was paretic for two or three days; the

leg swung characteristically while the foot dragged slightly. Marked rise of temperature always attended these status periods, ranging from 103° to 105° F.

The case about to be given is one in which, although there is an order of invasion, typical grand mal convulsions occur with full retention of consciousness. The phenomenon of exhaustion paralysis has occurred so repeatedly that there has at last resulted in this idiopathic epileptic a condition similar to true hemiplegia. The patient has also had at least five periods of true status with many *etats de mal* passage or serial periods, with more or less complete recovery as a result each time. The case notes are as follows:

CASE XIII.—J. P., male, aged 21; farmer. He has been an epileptic since childhood. No family history obtainable. His attacks were always considered of grand mal type, preceded by an aura of "twitching of the muscles," but this has not been constant. He is simple and feeble mentally.

The reflexes were normal and equal on admission; the pupils were very widely dilated at all times. There had been irregular dentition and a high-arched, contracted palate. His speech was drawling and monotonous, as is commonly seen in epilepsy (epileptic voice sign).

The patient's attacks occurred generally in groups, in series or in status periods. During the first year (1896), for a period of two days, he had 30 attacks. During the second year (1897) he had 160 attacks in a period of two days. This latter series marked a status period. During the third year (1898) he had but 90 attacks in two days; and during 1899 he had but 65 attacks in 48 hours; so, although the periods seem to have a less number of seizures in them latterly, exhaustion and convulsive phenomena were much more prominent. For instance, after the patient had his period of 160 seizures the first year, he recovered in two days his usual interparoxysmal state; but after a recent status, when but 60 seizures occurred, he required five days to recover. The paroxysmal phenomena seemed to form no index to the severity of the status. We have seen this patient have 40 attacks of grand mal epilepsy in two hours, and three hours from the first one he would be up and would attend to his work nearly as well as before. A peculiar and interesting fact associated with this case is that almost always consciousness was retained in some part. At times the severest grand mal seizures were accompanied by the conscious state. For illustration, in March, during period, a photograph of a general severe fit was taken in which questions were answered intelligently, although the facial muscles were rigid in tonic spasms.

After admission to the Colony, February 2d, 1897, patient had many series of attacks, twenty or thirty in five or six hours. After these severe seizures, which were general but greatly predominated in severity on the left side, he suffered from a left side paralysis, which was incomplete, being most severe and persistent in the forearm and thigh. Whenever the patient attempted to walk he dragged the left leg. This state of paralysis lasted

for two hours, after which he returned to an apparently normal condition and the knee-jerk of the left side remained exaggerated. The seizures and the paralysis were confined to the same side, in accordance with the general rule of exhaustion-paralysis.

February 16th, 1897, patient had three seizures, all of which were severe, and lasting from three to five minutes, general convulsions beginning and ending on the left side. The post-paroxysmal paralysis was noticeable and most marked in the left foot. The paralysis this time lasted but fifteen minutes. For the next sixteen or seventeen days the patient appeared to be as well as usual and was able to be about the house, although he had from ten to twenty severe attacks almost daily.

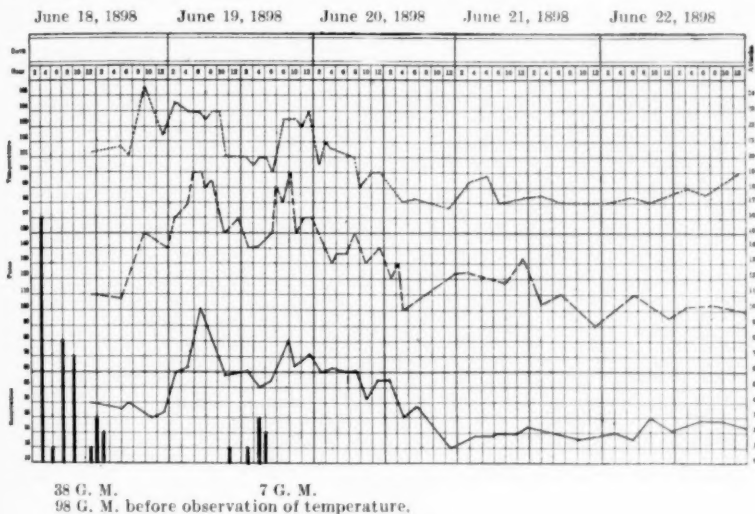


CHART XIV.

Upon physical examination March 10th, 1897, the patient showed no effects of his paralysis other than a slight increase of the tendon reflexes of the left side as compared with those of the right. There was also a slight spastic condition in the left leg. Motion and co-ordination were almost if not quite as perfect on the left side as on the right. During three status periods, each covering a period of several days, twenty observations were taken for the sake of verifying convulsions and paralysis, and they were found to be as follows: The onset of tonic convulsion was in the left leg and the left arm in the order given; then the right leg and the right arm became involved; finally, generalized over the entire body in severe convulsion. Reflexes of the left side were lost immediately after the attack, while paralytic symptoms were present. They reappeared with motor control at the end of ten minutes. The right reflexes exaggerated immediately after attacks, to become equal with their opposite at the end of half an hour. (See charts 14 and 15.)

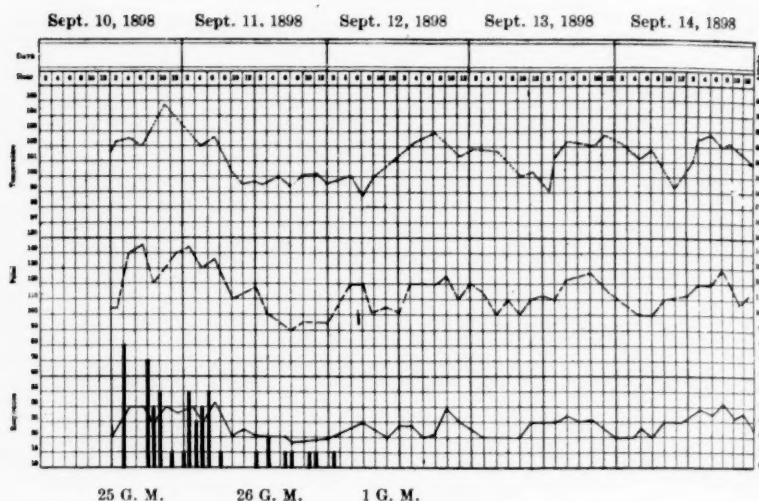


CHART XV.

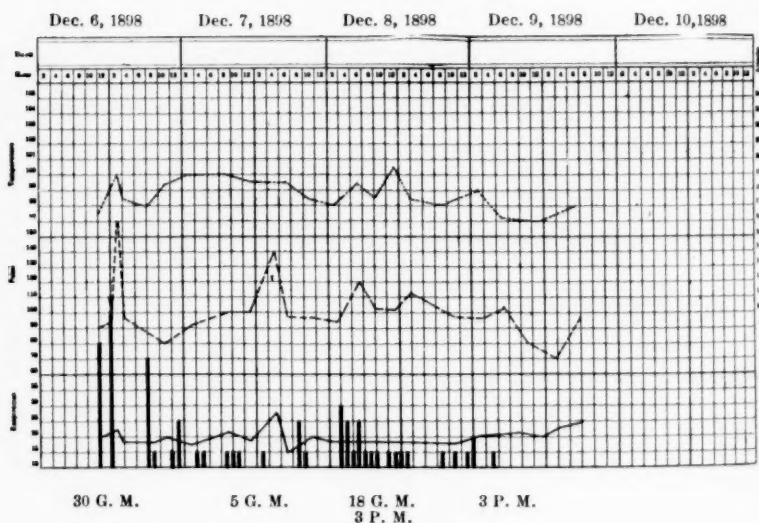


CHART XVI.

CHARTS XIV, XV AND XVI.—Show status in case J. P., an idiopathic epileptic having atypical focal fits with retention of consciousness during nearly all attacks. Note the rise of fever shown in Chart XIV after convulsions ceased, aborted by chloral and bromide, and the prompt control of the state on reappearance of convulsions Jan. 9, 1898.

During the status of the month of December, 1898 (see chart 16), a series of careful observations (fifteen) was made on different days of the period, and the following was the invariable rule for that period: Tonic spasm in the right leg and left arm, then the left leg and right arm participated in the convulsion, they being mostly in clonic spasm. Immediately after attacks, right knee-jerk and wrist-jerk were lost; after one-half hour they returned to normal. Paralysis persisted in the right leg for twenty minutes and in the left arm for ten minutes.

Isolated instances of crossed phenomena of convulsions and paralysis have continued to show themselves during the past three years, but have not been at all frequent or constant in the anomalous state. Paralysis always follows the general rule in this case, namely, parts most convulsed suffer most in the post-convulsive paralysis.

March 8th, 1899.—Patient has had about 150 seizures during the past three days; and although the attacks have been quite severe and always general, the muscular rigidity is most pronounced on the left side, which is now decidedly paretic in the upper and lower extremity; paralysis is most marked in the left leg. Left knee-jerk is markedly exaggerated and ankle clonus is also present; the gait is spastic-ataxic on the left side. The weakness of the left side includes the face and tongue.

In some of his severe general convulsions consciousness was retained throughout, following which the customary left side paralysis was manifest for a few minutes. The retention of consciousness in this case in grand mal attacks is of quite frequent occurrence. The convulsions of the left side remained tonic longest, thus proving the parts ultimately paralyzed were most convulsed. The original photograph is shown in Fig 6.

Occasionally serial epilepsy may manifest itself as Jacksonian in form, and yet not be hemiplegic in origin, as the above case, but they are rare and need to be studied with due caution, serving as reminders of the extreme rarity with which they exist in the idiopathic variety. This is the only case of repeated exhaustion producing motor tract degeneration and a permanent palsy that we have ever seen.

The occurrence of tetanoid grand mal attacks in epilepsy is rare, although the condition has been known since the time of Prichard (*Nervous Diseases*, 1822). Hoffman, Gowers, and Mercier have also reported unique cases. However, tetanoid attacks forming an entire status period are rare indeed, there being but two or three cases on record. The following case of status composed of tetanoid seizures is of great interest. The first of the two status periods was the more severe, but did not cause death, because the state of exhaustion, although extreme, was spread over a fairly long period of time. The second period of acute status, followed by death, is a good illustration of death from acute exhaustion.

CASE XIV.—W. R., a young man of 20, with a history of complete right hemiplegia at four years of age. Patient showed no evidence of infantile cerebral hemiplegia when he came under observation in 1897. He had a series of tetanoid spasms on October 31st, 1898. The spasms occurred with considerable regularity, about three taking place every five minutes, then a free period of five minutes would intervene. One tetanoid fit occurred at 7:40 p. m., and was followed by classic grand mal seizures of epilepsy until 8:40 p. m. From the onset the patient remained comatose. Between the attacks he remained in a period of stertor and snored as loudly as a patient in ether narcosis. So much asphyxia was present that the lower jaw thrust forward as in giving an anæsthetic. This act materially aided the patient in breathing.

The attacks were preceded by the premonitory signs of an expectant, listening attitude, during which the respiration was suspended. The head was first slightly rotated to the right, and then decidedly to the left; the spasm then passed rapidly over the entire body, apparently bilaterally from head to foot in a wave-like manner. All the muscles were in tonic rigidity each time for fifteen to twenty seconds. The back was well arched, as in tetanus, giving a striking resemblance to Bell's picture of the disease; but, of course, not as in his well-known picture of the opisthotonic muscular contraction.

By placing the fingers under the ankle the entire body could be lifted from the floor, the upper end of the body resting on the occiput. The physician's hands were placed over the entire body at different times in various attacks, and it was found that the seizures maintained their same general tonic "tetanoid" character throughout. The feet were extended and arched, the toes being flexed. The hands underwent slight external rotation without being clenched. No clonic spasms appeared from 8:30 to 11:20, the end of the serial period.

Prior to this status patient has had typical grand mal fits, of which the following is an abstract of one witnessed by myself: A low moan preceded the deflection of the head to the right two or three seconds; then the body rotated six times to the right before the patient fell (*epilepsy rotatus*). General clonic spasm occurred as soon as he struck the floor. Involuntary defecation and urination followed the muscular spasm. The tonic period lasted about ten seconds, while the clonic existed for thirty seconds; stertor occupied a period of one minute, and this in turn was followed by a deep sleep for one hour. The patient is very muscular in spite of the fact of an early cerebral palsy of the right side, traces of which are still present.

It was very interesting to notice the rapid disappearance of the muscular rigidity when the spasm ceased in this tetanoid variety of seizures. The muscular rigidity seemed to melt beneath the grasp and the body would then be completely relaxed. The body at all times in and out of the spasm remained in nearly the anatomical position when not distinctly specified to the contrary in the above text.

For weeks the patient had been free from the use of bromides in order to use them with the greatest possible effect when his series appeared. The

bromides were given in drachm doses every two hours after the seizures became frequent, until 180 grains had been taken. When the medicated enemas were no longer retained (the violence of the tetanoid seizures often caused an expulsion of the enema) the bromides were given by hypodermic injection. It will be seen by reference to the graphic chart that the clinical condition as a whole was that of a typical case of status epilepticus.

At the period of tetanoid seizures, October 31st, the heart's action was plainly audible many feet away, so intense was its overburdened activity. Deep cyanosis was present and was increased until the end of the series at 11:10 p. m. Death must have soon taken place had the attacks not ceased. As it was, the patient was completely exhausted for six days.

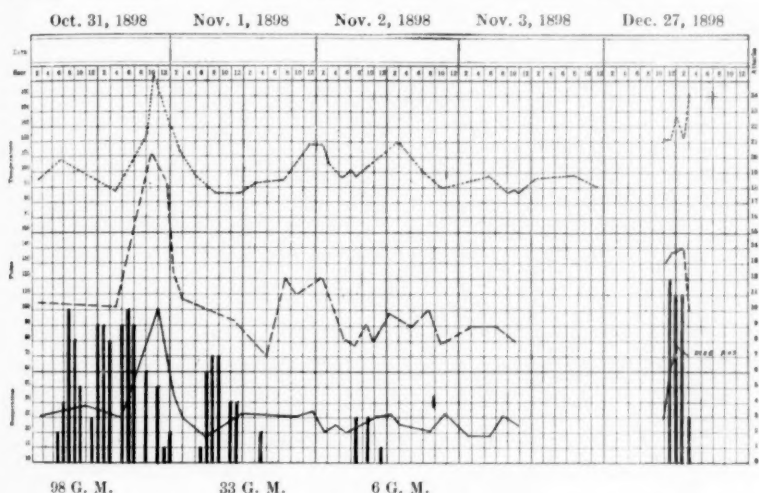


CHART XVII.—Shows case W. R. in tetanoid status epilepticus, the severest form of epilepsy known. For the sake of convenience, the fatal period of the second attack of status is shown on this same chart. The second status was not tetanoid, but of the fulminant type so quickly fatal before drugs have a chance to act.

On the second day, November 1st, a confluent papular eruption (herpes facialis) appeared on the left cheek, extending about two inches on the upper and one and one-half inches on the lower jaw, and also reaching within about half an inch of the corner of the mouth. November 2d and 3d were passed for the most part in sleep. When aroused the patient showed delirium. Delusions as to identity and surroundings were present for two weeks; at the end of this time the patient resumed his usual interparoxysmal state.

Two months after the status period, composed for the most part of tetanoid seizures, the patient had another status period, which finally ended in exhaustion and death. (For clinical record see chart.) The seizures immediately preceding this fatal period were not severe at the beginning.

The forenoon and afternoon of the 26th of December were passed in out-of-door sports—in ice skating. At 3 and 4 p. m. of this day he had several slight attacks, termed "fainting spells," and after having had ten of these he was placed in bed for more careful attention. At 6:30 p. m. he had 20 grains of chloral and 30 grains of potassium bromide. Again at 8 p. m. he was given 20 grains more of chloral, but this in no way interfered with the increasing frequency and severity of epileptic fits, which, throughout the entire period, were typical grand mal in character, both clonic and tonic, without distinct order of invasion. The attacks, 62 in all, were far less severe than the tetanoid period. The patient died at 3:05 a. m. December 27th. Respiration ceased one and one-half minutes after the heart ceased its action, a phenomenon infrequently noticed in status.

The autopsy, held 15 hours after death, showed that the membranes of the brain in external appearance were normal—the longitudinal sinus was completely empty. The external aspect of the brain was very dry, contrary to the usual congestive stage of the convulsive stage of the status. A section of the brain substance showed a decided blanched, porcelain appearance. All organs of the chest were normal. The heart was in diastole and presented left ventricular hypertrophy. The organs of the abdominal viscera were all engorged. No infarcts were found save in the spleen, where a large infarct was located centrally. The spleen was double the normal size. The microscopical findings in the brain were as follows:

The postmortem changes were so decided as to interfere seriously with the microscopical examination of the cortex. There was, however, marked broadening of the outer cortical layer and diminution in the number of cells of the second cortical layer. In some portions there was almost an entire absence of cells of the second layer. There were evidences of marked chromatolysis and there were many punctate hemorrhages. The neuroglia was not stained.

There can be but one logical explanation for tetanoid attacks, namely, the "cortical discharge" is so sudden and continuous that no interval of muscular relaxation (as in clonic spasm) is permitted. In other words, a tetanoid or tonic fit must be considered the most intensive type of epilepsy known. It is interesting to note this organic palsy behaved throughout in isolated fits and in serial and status epilepticus as though it were an idiopathic epilepsy. There was no focal onset, order of invasion, sequential local paresis, etc., a fact fairly well known and previously commented upon by Feré, Gowers and others. It must, however, be noted here that the evidence of an early palsy was so slight that it had been frequently overlooked and would hardly have been noticed at the Colony had not a family history of palsy been given at the time of admission. This latter fact is a signal

contribution to Freud's contention that many of the severer epilepsies are dependent upon "infantile hemiplegia *without palsy*."

The tendency for partial epilepsies to become gtneral is the most unfavorable sign in the face of treatment, whether the case be Jacksonian or idiopathic epilepsy; so it is in regard to status unilateralis; the more nearly it approximates grand mal status, the more the danger of a speedy and fatal termination becomes. The following case not only shows this point *par excellence*, but many varied anomalies of exhaustion paralysis are in evidence. The case is as follows:

CASE XV.—C. P., boy aged 13 years. His epilepsy began at three years of age. His attacks are generally grand mal. His paternal uncle was an epileptic; his father rheumatic; mother was migraine. Patient had convulsions at dentition. He is the youngest in family of three. Other history is negative. Patient's first prolonged continuous clonic convulsion, accompanied by much physical depression for several days, occurred January 7th, 1899, and the details are as follows:

At 10 a. m. January 7th patient had a severe convulsion, another at 10.20 a. m., and a third at 10:55 a. m. (See chart 18.) After this time until 11:20 patient was more or less in a continuous spasm. At 10:35 the pulse was 110, temperature 100° F. The convulsions began and were most prominent in the left side, the muscles of the arm and forearm being most convulsed, and those of the neck, face and leg being least involved. The spasm was clonic in nature and rhythmic, occurring about seventy times per minute; each convulsive movement consisting of one tonic contraction of the muscles involved. When the movements increased in number, as they did every three or four minutes, the right side participated in the convulsion to a slight extent. At times the clonic spasm was severe enough to elevate the left arm and leg, and throw these members about for a space of six or seven inches. The face was deeply congested, as was also the whole surface of the body. Profuse general perspiration attended the epileptic phenomena.

The temperature was at no time elevated beyond 100° F. For the most part it remained normal. The pulse reached a maximum for the interparoxysmal state at 120 at 11:30. Respiration remained about normal throughout. At 10:35 chloral grains 20 and bromide grains 20 were given by enema. At 11:10 a hypodermic of potassium bromide was given in the right breast. After the spasm ceased the patient remained in a comatose state until 11:40, when he became partially conscious and quite restless.

At 2:30 p. m. observations in regard to paralysis were made and it was found that the whole left side was paretic, being most marked in the hand. Comparative hand grasps showed dynamometer right 35; left, 15. The finer muscular adjustments were lost, which was manifest by picking pins from a porcelain dish. Comparative test showed sense of the left side was not materially changed. Slight fibrillary tremor was noticed in the right hand. Reflexes of the left side were all exaggerated.

Observations 24 hours after the last convulsive movement still showed slight paretic condition; but being decidedly less than at the first observation. One week after, paralytic phenomena had entirely disappeared and no evidence of it remained in reflexes and has not been present since.

His attacks ordinarily are as described in the following two notes: April 25th, 1899, patient had an attack at 3:25 p. m. The patient began clapping his hands and dancing for a few seconds before falling. The muscles of the left side of the face were first affected; then the neck and left arm; then the contraction became general; the lower limbs were rigid, and the head was thrown to the left. This lasted 30 seconds, then the contraction became clonic; the limbs were jerked about; the jaws were opened and closed rapidly, followed by stertorous breathing. The clonic spasm lasted about a minute; he then sank into coma, which lasted about an hour.

The hand grasp was strongest in the left hand. Patient lost consciousness during the first part of the attack and could not remember anything that happened. The face was congested and around the mouth was a livid hue. The forehead and cheeks were covered with sweat; the hands were white and moist; the nails purple, and the pupils of the eyes were dilated. When spoken to he did not answer, but his lips moved. April 30th, 1899, at 9:30 a. m. patient had another attack. His face was bright red color; the lips were white; the hands white and moist, and the pupils dilated. The face was covered with perspiration. There was no muscular contraction. Before the onset of the attack he complained of headache; he appeared to be frightened at something. He lost consciousness at the beginning of the attack and did not remember what happened. The attacks lasted about three minutes.

Another continuous clonic spasm, in greater part consisting of a monospasm, occurred June 29th, 1899, and was as follows (see chart 18): The first seizure occurred at 4:57 p. m. Patient at the time of seizure was sitting on the stairs. There was no warning and no cry. The first visible indication that a seizure was in progress was the turning of the patient's head to the left. The body became rigid and the patient was placed on the floor. The eyes turned to the left; the pupils were widely dilated; the eye-lids drooping. Muscular spasm was first noticeable about the eyes and mouth. The muscles of the upper left extremity were the next to become involved, beginning with those in the fingers and passing up to the trunk; then those of the left lower extremity. Muscular spasm then became general over the entire body. The duration of tonic spasm was 20 seconds. Tonic spasm was followed by clonic, with the same order of invasion, and was confined to the upper extremities—duration five minutes. *Rose mottling was very marked on face and neck and was appreciable to touch.*

Near the close of the clonic spasm the skin was perfectly colorless around the mouth, over the nose and extending to the forehead. The patient perspired freely on the wrist, chest and forehead. Six minutes from the time the seizure occurred the patient was conscious. There was no period of stertor.

The second seizure occurred at 5:11 p. m. The whole face became livid; muscular spasm was clonic. The order of invasion was the same as in the first seizure; duration eight minutes. Patient regained consciousness and answered questions when spoken to four minutes before convulsions ceased.

The third seizure occurred at 5:24 p. m., and was clonic; duration six minutes. Patient was not conscious. Fourth seizure occurred at 5:31 p. m.; duration one hour. Muscular spasm ceased at 6:30. Last muscles to be convulsed were the four fingers of the left hand. Chart of June 29th shows but little alteration in temperature and pulse. In fact, if exhaustion, physical and mental, was not so severe and long continued after these severe prolonged clonic spasms, they would not be considered so dangerous.

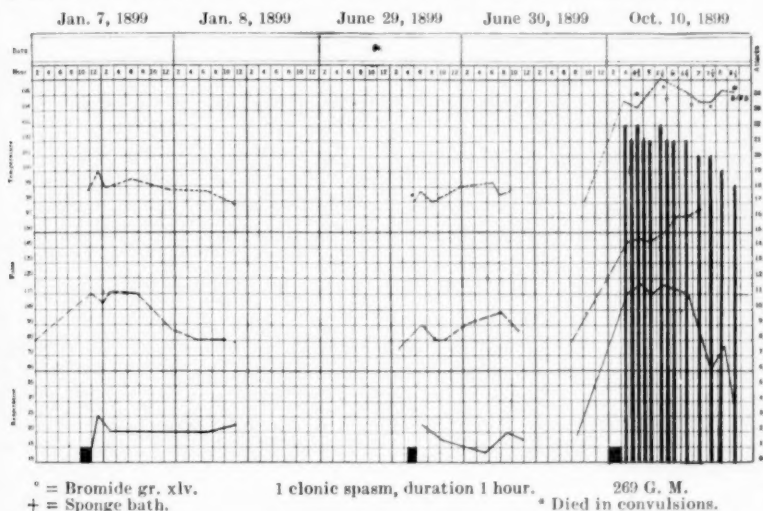


CHART XVIII.—Shows three short status periods in case C. P. described in detail in text, the last one being fatal. Note the occurrence of a more or less continuous clonic period at the beginning of each status attack. The first two were aborted, but treatment failed in the third period.

No deaths have occurred in the four cases presented of this particular kind of status. Although the gravity of such acute epilepsy is appalling to the clinical observer, yet so long as the convulsion remains unilateral little danger may be expected. Successful treatment in most of these cases has been by hypodermics of bromide and inhalations of chloroform.

October 10th, 1899, the patient had a severe attack, a typical grand mal seizure of classic epilepsy, which was characteristic of his usual paroxysmal attacks between imbricated status periods. (See chart 18.) After this fit he slept about fifteen minutes. At 9:25 a. m. a peculiar attack occurred as follows: The seizure was confined entirely to the eyeballs, there being no winking of the eyelids. The palpebral fissure was about at normal, but the eyeballs were symmetrically rolled up so that only the whites of the

eyeballs were presented. They remained in this position with only slight tremor or vertical nystagmus for about two minutes. Patient was conscious all the time, and tried to correct the malposition of the eyeballs by rubbing his eyes. The convulsion was not painful, but, as the patient could not see, he asked to be led to a seat, where he sat down until the eyeballs returned to their normal position. In eight minutes another similar attack occurred.

At 11:05 a. m. the same day the patient had a severe convulsion, beginning in the following manner: He clapped his hands, and raised the left foot from the floor; he hopped backward on the right foot four or five feet, and finally fell to the left side, bruising the back of the head. The attack was general, consisting of tonic and clonic convulsions, but in ceasing the clonic convulsions ended on the left side of the mouth and about the left eye. The left foot and hand were next in order of cessation. The entire attack lasted two minutes. No paralysis could be detected at this time. Consciousness was lost slowly, but returned quickly, and the patient was at work again at noon.

At 1:35 p. m. the patient was again affected with a severe convulsion. The attack began without the usual premonition or aura. Just before the convulsions became prominent a marked ring of pallor was noticed about the mouth and on the tip of the nose. The cheeks and neck were deeply flushed. The first convulsions were clonic, shutter-like movements of the eyelids of both sides, with an entire facial movement being most exaggerated. The mouth was drawn spasmodically to the left in quick jerks. The convulsion then extended to the right hand and arm, extending to the forearm and lastly to the hand. The left leg next became involved. All muscular spasm up to this time was clonic in nature, except in the right arm, forearm and hand. The right arm was in tonic convulsion and continued in this form of spasm, while the other parts were in clonic movements. Finally, the left arm passed into clonic spasm, and then the right leg rapidly followed in the same form of convulsion. The convulsion had now spread over the entire body, zigzagging across in its successive involvement of the different members of the body in the following manner: both eyes, most in the left; left face; right arm; left leg; left arm; right leg. Part was in tonic spasm and part in clonic spasm at the same time. The left leg and right arm participated most in convulsions. The right hand clenched while the left hand, participating but slightly in convulsion, remained open. Reliable tests for paralysis of these parts could not be made at this time. In a few seconds the general convulsions ceased, and the seizure *continued to alternate first on one side, then on the other*, in sharp clonic spasms every few seconds, thirty or forty occurring on one side in two or three minutes, before changing over to the other side. In about ten minutes, the clonic convulsive phenomena gradually lessened in severity, then the whole character quickly changed to general tonic, tetanoid or statuesque seizures. Soon the general tetanoid seizures changed to unilateral tetanoid, and then these spasms alternated from one side of the body to the other, for a short time, as did the previous clonic spasms; then the

upper extremities alternated with the lower extremities in periods of tonic rigidity.

In general seizures the right arm and left leg were noticed to be synchronously involved. The convulsions in general throughout were accompanied by the usual symptoms of a classic epileptic attack, when not specified to the contrary.

A raised bright erythematous rash was plainly visible about the sides or margin of the face and on the neck. It was not hemorrhagic in origin, as is commonly seen in some cases of epilepsy. The rash did not appear about the mouth or on the tip of the nose, which constantly presented the bloodless appearance characteristic of frost bites (Raynaud's asphyxia syndrome).

Observations from 3 p. m. until death at 8:30 p. m. are as follows: At 3 p. m. the convulsions had been in more or less constant display for one hour and twenty-five minutes, and the patient had long since entered the typical convulsive stage of status. The temperature rose rapidly. At 5 p. m. it was 106.2° F., pulse 160, respiration 68. At 3:30 p. m. patient was in general convulsions again, and photographs were taken which show many interesting phenomena. In the short period following a few of the general seizures, the right arm was found to fall as a "paralyzed arm" when raised, in marked contrast to the absence of such behavior in the left. At infrequent intervals the left leg showed the same phenomenon. This phenomenon was always most marked in the foot, in marked contrast to the more frequent paralysis which was most prominent in the right arm. Many varying grades of these paralytic manifestations were noticed in the right arm in the semi-conscious states, such as tremors, slowness of movements and inco-ordinate acts.

At 4 p. m. patient passed into deep coma, the "white circle" about his mouth becoming more noticeable as the general cyanosis increased. At 4:20 p. m. at intervals of every two minutes, carpo-pedal contractures occurred, and lasted for two hours, when true tetanoid or statuesque seizures returned again. The arms were extended; all the muscles stood out plainly; the hands were clenched, and rotated inward, then outward. The eyes during the convulsions were wide open and staring. Between attacks they were in slow rhythmic lateral mystagmus. The lower limbs were extended and rigid, while the feet were in the infantile eclamptic posture. These attacks occurred every few seconds, during a period of half a minute, and were rapidly asphyxiating the patient. They suddenly ceased at 7 p. m. and there was a return to complete left side spasmodic flexure of the upper and lower extremities. This convulsive state continued for half an hour, flexions occurring every few seconds. Between convulsions the right arm was flaccid, but the left foot below the knee continued rigid in the position of pes equinus varus until death at 8:30 p. m. There was involuntary defecation and micturation in the statuesque or tetanoid attacks. The patient died from asphyxia in the beginning of a general tetanoid convulsion.

Some fifteen minutes before death advanced cardiac and respiratory paralysis were manifest; respiration was largely thoracic and of the Cheynne-Stokes type. Hypodermics of bromide, enemata of chloral and bromide, and chloroform anæsthesia were all given without material benefit. No autopsy could be obtained.

I wish to call attention to the varied forms of convulsions and the rapid desultory fire, as it were, of the different cortical centers. It should be noted that although this status period differed from the left side clonic spasm of the left arm and face described in this case, yet here we meet with general convulsions with left leg and right arm, the parts ultimately paralyzed, predominating, which was manifest in the early contracture, in the later flaccidity and finally in persistent left leg rigidity. A casual observer seeing but one or two convulsions would have pronounced this case anomalous, *i. e.*, right arm and left leg paralysis with general convulsions. But we see the case in the true light after a careful study.

Again, the seizures at 9.25, on October 10, was interesting, as also was the pallor about the mouth and on the tip of the nose, and the erythema.

Finally the patient passed from comparative health to death, in seven hours, an unusually rapid termination, dying of asphyxia produced by the epileptic paroxysm, a rare form of death of an epileptic. No autopsy was permitted.

The following case is a good illustration of the postmortem rise in temperature in acute status, dying in the midst of convulsions, although but 27 grand mal seizures occurred. The postmortem rise in the temperature is occasionally seen in status cases dying in the midst of convulsions. In such the impetus to the formation of body heat projects beyond the life of the patient. The case is briefly as follows:

CASE XVI.—Charles M., aged 16 years. He was first admitted to the Colony on January 7th, 1897. His first attacks of epilepsy occurred at two years of age, during dentition. He was feeble-minded and presented many psychical and physical signs of degeneracy. A history of serial attacks and two status periods was obtained on admission.

At re-admission on July 9th, 1900, the patient was suffering from extreme bromism, and a reduction of that drug was made. Although done with extreme caution, it precipitated the patient into frequent serial periods. Finally, acute status developed and death occurred on September 25th, 1900 (see chart 19). No autopsy was permitted.

The postmortem rise of temperature of status is probably not seen more frequently, as most status cases have a short stuporous stage in which the heat regulations of the body have sufficient time to absorb and dissipate the chemic changes inducing the fever. Indeed, the postmortem rise is almost exclusively to be sought in those acute cases or fulminant types of status the duration of which has extended over but a few hours.

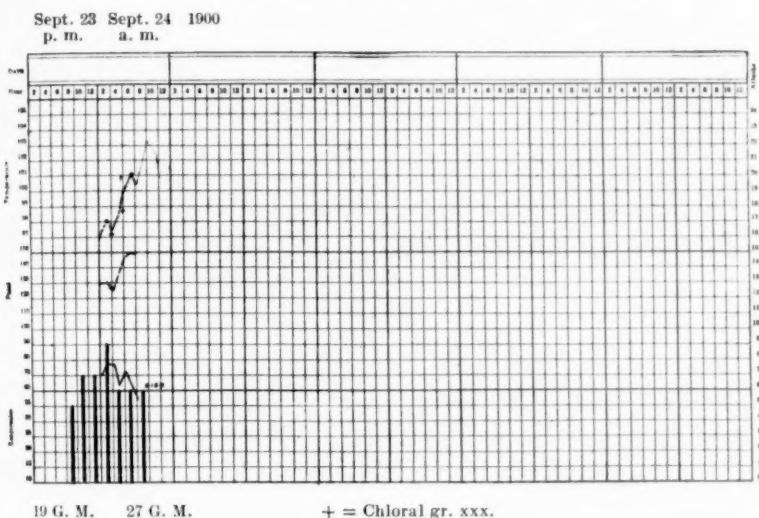
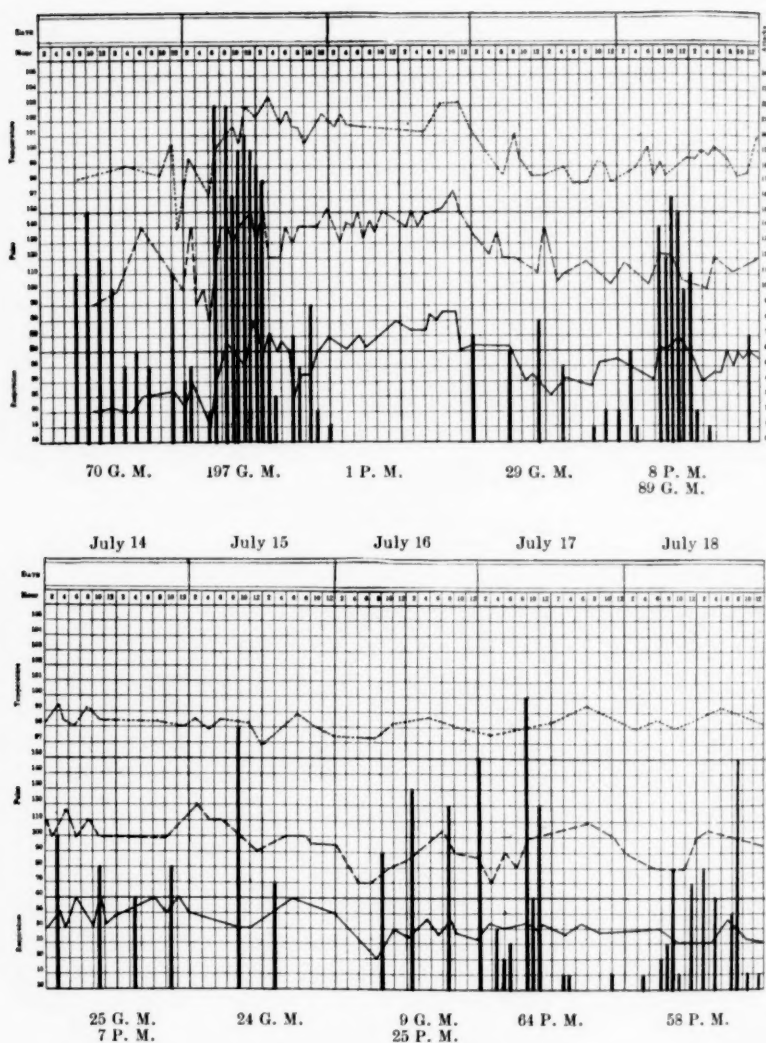


CHART XIX.—Shows case C. M. in a fatal status with a marked post-mortem rise of temperature. Patient died in the convulsive stage. For discussion of the phenomenon see text and author's paper, "A Clinical and Pathological Study in Status Epilepticus," Amer. Jour. of Insanity, April, 1904, p. 658.

The next case is given in entirety to show the complete but abbreviated life history of several status periods in the one case. Attention is called to the pure exhaustion palsy (transient) on the right side associated at the same time with exhaustion palsy superimposed on organic palsy on the left side in the one case. The anomaly of the different types of fits is worthy of note. Finally, the autopsy findings are a contribution to the theory that many cases of hemiplegia as well as diplegia often present no gross or even microscopical lesions to account for the early and persistent palsy, a fact recently commented upon at length by Spielmeyer, Rhein, Spiller, and others.



CHARTS XX AND XXI.—Show the first status period in a hemiplegic girl (M. E. H.). Note the abortion of the status and its recurrence on the third day (July 13th), caused by a too rapid elimination of the sedatives given in the status of the 9th and 10th of July. Chart XXI well illustrates a partly checked status, so diffused over several days that the fatal consequences of the status are eliminated. The relationship of the cardinal curves to that of the causative seizures is fairly typical of the ordinary status.

CASE XVII.—Mary E. H., aged 12 years; neurotic family history. Her epilepsy began at four and a half years of age, one year after infantile cerebral palsy, which resulted in a partial left hemiplegia. The convulsions occurred frequently in series and involved the left side first and most. The face was not affected in the hemiplegia nor in the after hemispasm, but temperature and loss of speech have resulted occasionally after left side convulsion.

Following the status of July (charts 20 and 21), made up of grand mal attacks with a left side order of invasion, a complete left hemiplegia resulted for three weeks. The right side was apparently but little affected. The convulsions affected the left side most. The July status was largely

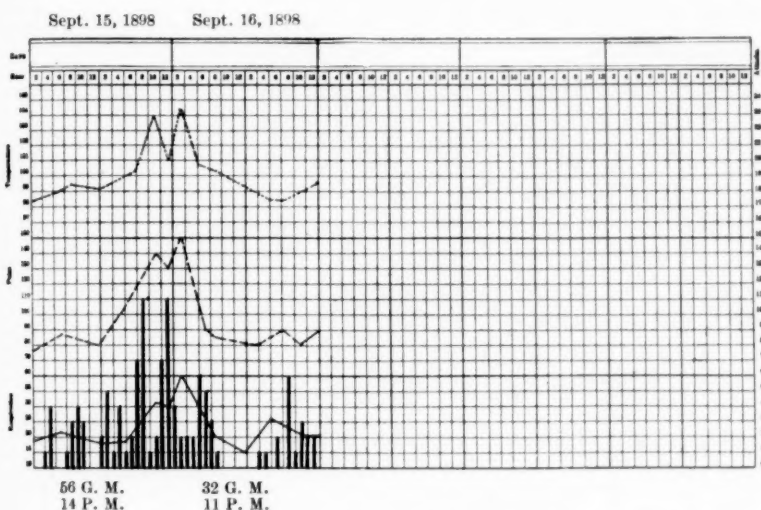


CHART XXII.—An aborted status period in the subsequent case (M. E. H.). A more energetic sedation was used here than in the previous chart (XXI).

provoked, or better, permitted, by a partial withdrawal of sedatives incidental to her admission to the Colony. Although during the latter part of this period the patient had many seizures, there were fairly long intervals of rest and recuperation between, as shown in the chart, consequently the fever, pulse and respiratory curves did not suffer marked alteration.

After the September 15th and 16th status period (see chart 22), which was a status aborted by chloral and bromide, temporary paralysis followed on the right side and especially in the right arm, but a more complete paralysis followed after the status from September 28th to October 8th (see charts 23 and 24). The 216 seizures were focalized in greater part on the right side. The first 50 attacks of this status period more or less completely paralyzed the left (organic hemiplegic) side.

October 8th, 1898.—The fingers of the right hand assume a state of athetoid spasm (Strumpell); index finger is extended; the thumb flexed to the side of the metacarpal phalangeal joint and over the third and little fingers in semi-flexion at the second joint. The third and little fingers are flexed only at the knuckle; other joints of the fingers are nearly straight. Continuous slight fibrillary tremor is found in all the fingers,

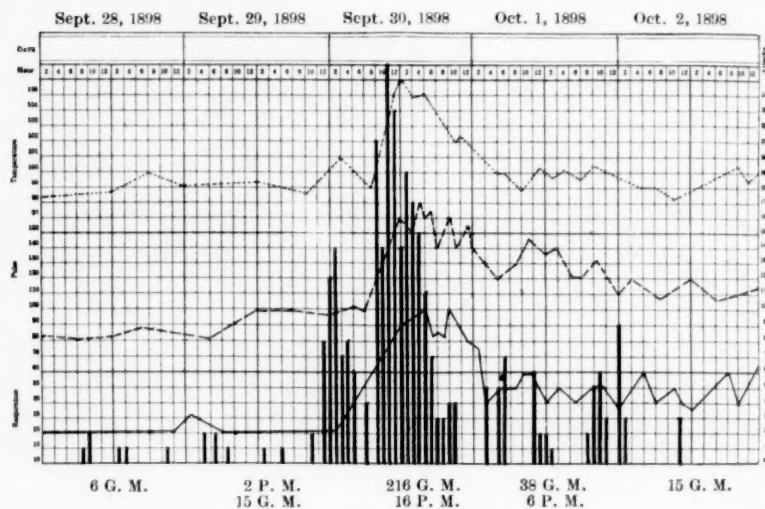


CHART XXIII.

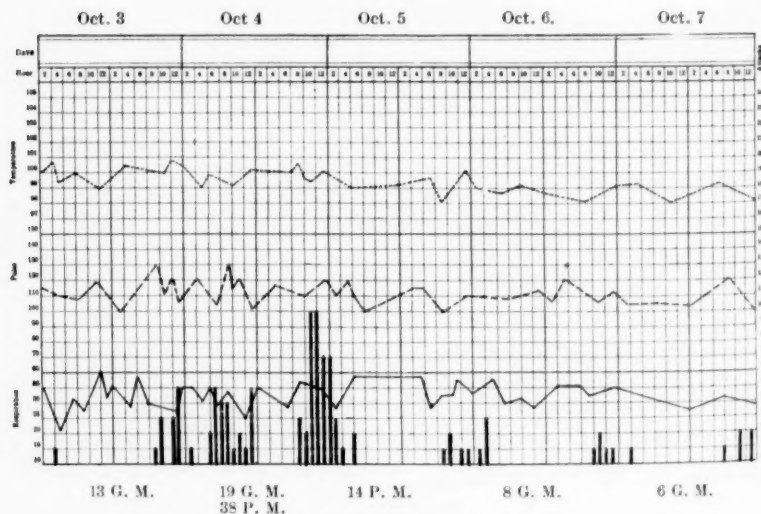


CHART XXIV.

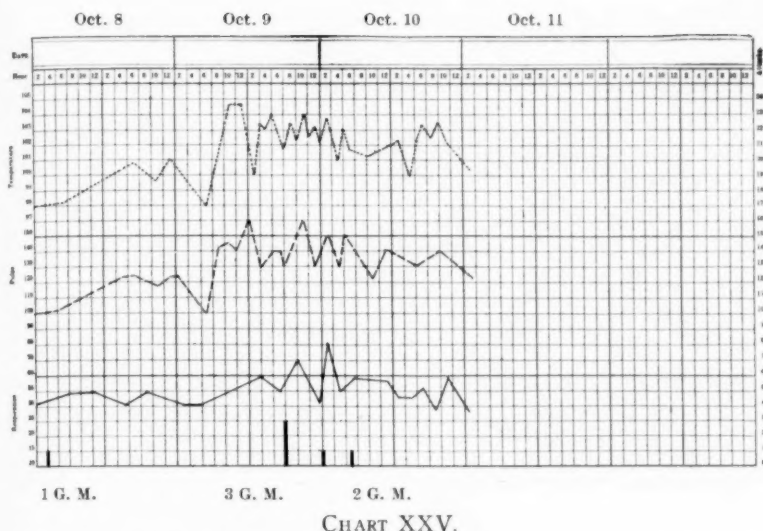
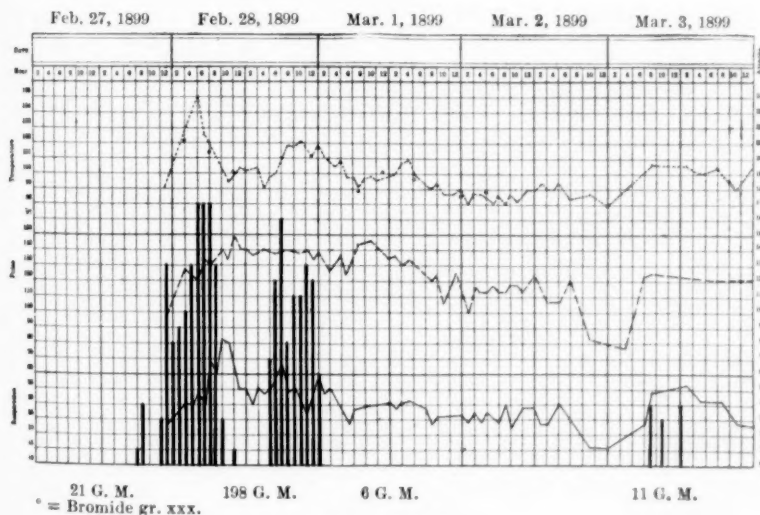


CHART XXV.

CHARTS XXIII, XXIV, AND XXV.—Show a severe status (4th in the series shown in previous charts of the same case, M. E. H.). The period was again slowly controlled by sedation and its too rapid withdrawal permitted a slight recurrence of the status again. The charts are fairly classic of a severe status.



° = Bromide gr. xxx.

CHART XXVI.

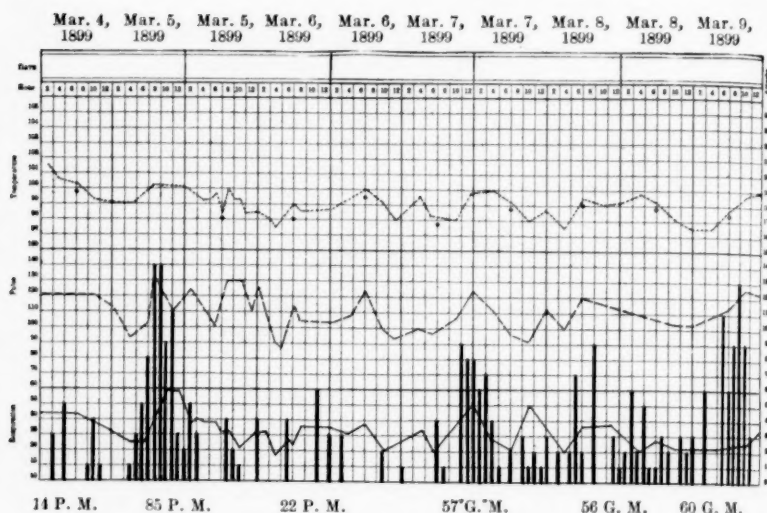


CHART XXVII.

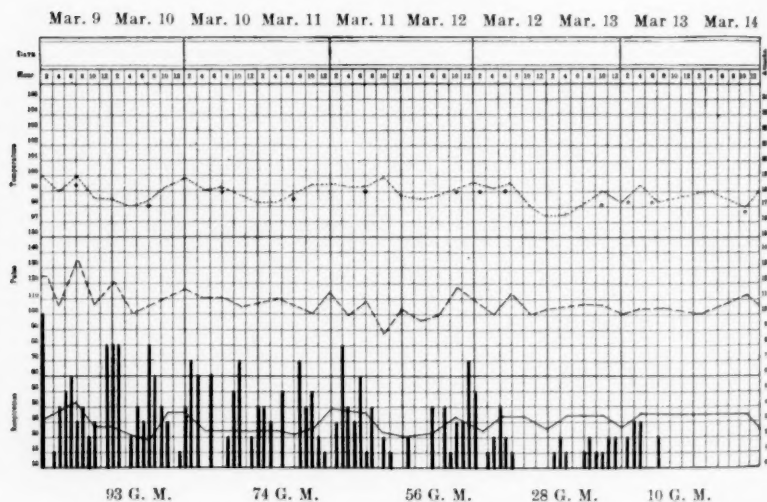


CHART XXVIII.

CHARTS XXVI, XXVII, AND XXVIII.—Show the 5th status period of the same case promptly controlled by bromide on the 28th and then after the withdrawal of the sedation, March 2, a slight and persistent recurrence of the convulsive stage followed. In spite of a considerable degree of sedation, attacks continued to occur. Experience has taught that one needs to gauge the amount of sedation to be given by the degree of exhaustion of the circulation, respiration and bodily temperature rather than the frequency and severity of the fits themselves.

especially the third and little fingers. Earnest voluntary effort enables the fingers to be partially extended at the knuckles, but such effort is attended by some pain and performed very slowly. Painful contracture which complicates palsy is called by some the post-epileptic paralytic equivalent.

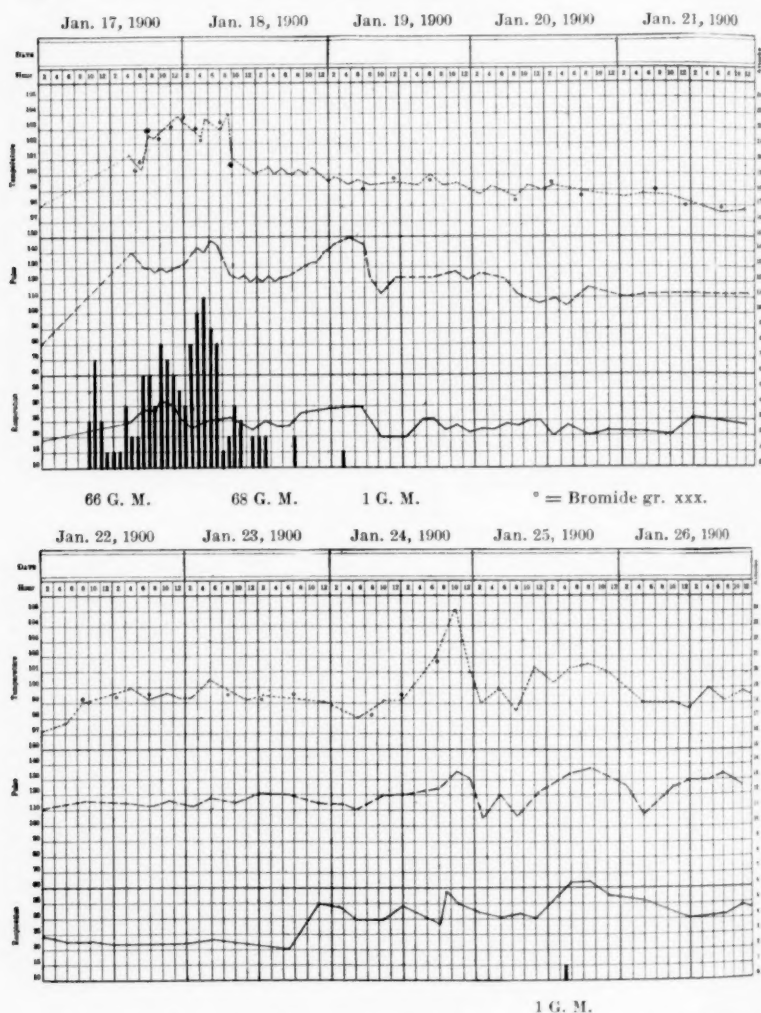
After the fifth status March 1st, 1899, patient was conscious, but could not speak, although she made persistent and earnest effort to do so (see charts 25 to 28). The entire right side was more or less paralyzed, motion returning in the right leg first. Efforts to grasp with the right hand were attended by associated movements in the left side, but no movement of the right hand; later motion was obtained. Contrary to the observations of other authors there was increased weakness of the left side, although it did not participate in these convulsions. Return of motion of the right hand was slow and the flexion was always preceded by an initial extension in endeavoring to grasp any object. Once flexed, the hand remained in that position for six or eight seconds after efforts to loosen the grasp were made (myotonic symptom). This latter condition speedily improved during the day. The next day (March 2d) the patient was able to raise the right upper extremity from the bed, but the effort was attended by violent associated movements of the left extremities (upper and lower). Giant urticaria appeared at 2 p. m., lasting for fifteen minutes.

During this period of status just described convulsions and paralytic phenomena were completely limited to the right side from the beginning to the end, a rare condition in infantile hemiplegic epileptics. The contractures were not painful and the sensation was not impaired.

March 3d a series of convulsions occurred, consisting entirely of convulsions of the following character: Convulsions began in the right side of the neck, rotating the head slightly to the right, eyeballs similarly deflected to the right, and right facial spasm present; then the head, eyes and mouth turned slowly but decidedly to the left and finally to the right side in complete and forceful rotation. The spasms then began in the right arm, distally and proximally at once; slight flexion and rigidity occurred, causing the arm to be raised fibrillarily as a whole high above the head. In about five seconds both legs passed into tonic rigidity simultaneously. The left arm remained free throughout the entire series of 577 seizures, except once, to be mentioned later. At 3:50 p. m. the grasp of the left hand was 25; the right, 14. A severe attack followed the test of the left hand; it was confined mostly to the left side and especially to the left arm. Five minutes after this attack a slight right-sided seizure took place. Both these attacks were out of the periods running between attacks and seemed produced in large measure by muscular tests.

On August 4th, 1899, patient developed *etat de mal passage*, but it was early brought under control by bromides. Again, a severe status developed on January 17th, 1900, of the same general character, from a convulsive and exhaustive standpoint, as that heretofore described (see charts 29 and 30). October 8th, 1898, it was effectually controlled by bromides, but on January 24th an unexplainable rise in the three cardinal curves occurred. Perhaps these secondary fevers might be the results of secondary intoxication for

which Lorenz so frequently finds a rise of temperature in the stuporous stage.



CHARTS XXIX AND XXX.—Show the 6th status period of the same case (M. E. H.). Note the unexplainable secondary rise in cardinal curves on Jan. 24th without convulsions. The status was again controlled by sedation.

August 6th the status was typical; also a slight secondary rise is also seen on the 11th, without convulsive cause (see chart 31). Her fatal status period began January 13th, 1901 (see chart 32). The following order of invasion was noted on the 14th:

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When seen patient was in interparoxysmal stage and in coma. Her temperature was 102° F. Her convulsions began by a twitching in the

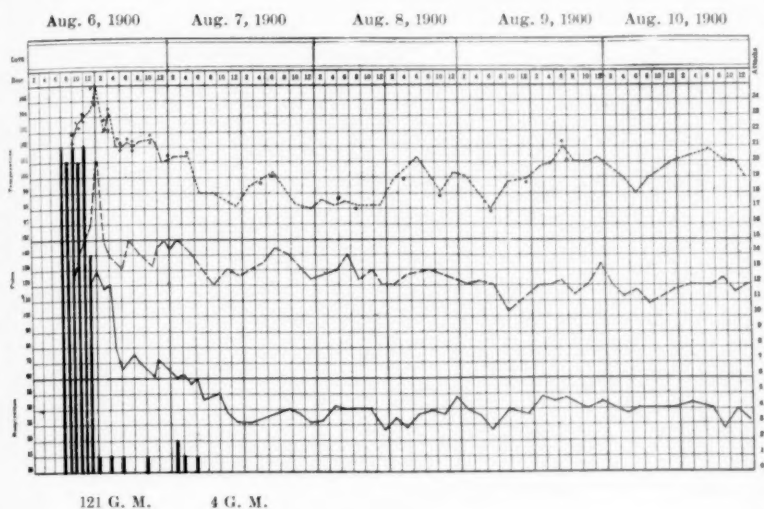


CHART XXXI—Shows the same case (M. E. H.) in the 7th status period controlled by bromide and chloral. Note the paradoxical secondary and tertiary rise in cardinal curves Aug. 8th and 9th without convulsions.

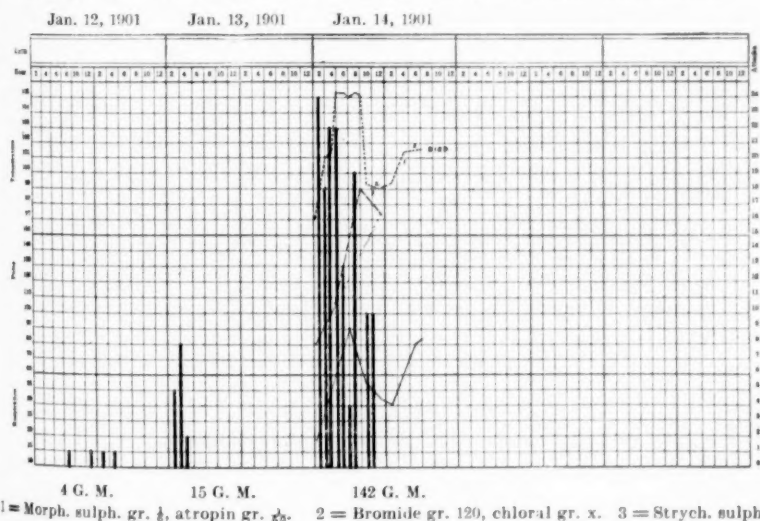


CHART XXXII.—Shows the final fatal status period of M. E. H., the 8th, in the life series. Note the acuteness of the chart picture of the fatal termination. There was no marked postmortem rise of temperature.

muscles of the face and eyelids. The right angle of mouth was drawn down and the muscles of the face were in clonic spasm. Head was turned to the right; eyes in dextioversion, with frequent twitching; later, eyes rolled upward. In about eight or nine seconds the left arm became involved; forearm flexed at right angles to arm and in tonic convulsion. The fingers of the left hand were straight, the palm flexing on wrist; the thumb was in extreme adduction. The arm was then carried forward to what would be the horizontal position when the body is placed erect. Outward rotation of left arm, carrying the hand over the face and nearly touching the tip of the nose. During this time the face returned slightly to the normal position, but did not turn to the left of the median line. The convulsion in the facial muscles had ceased by the time the hand was carried across the face. The left arm then gave a few clonic movements and came to rest by the side. The thumb flexed in the palm and the fist closed with the wrist slightly flexed.

Just as the convulsions began to cease in the left arm the right arm, which up to that time had been motionless at the side, became involved. The entire body turned slightly toward the right side, and the regular progression of the convulsion was presented by patient lying partially on her right side. She then turned flat on her back and the convulsion in the right arm progressed in somewhat similar manner to that on the left side. The arm was not raised as far forward as on the left side, and in passing into the clonic stage it dropped to the side by inward rotation, with elbow flexed. The clonic stage lasted about eight seconds in the right arm, which was about double the time of the clonic stage in the left arm. The lower extremities were not involved and the only movement they made was during rotation of the body to the right at the onset of the spasm in the right arm, when the pelvis tilted to the right, carrying with it the thighs, which remained in a slightly flexed position.

Stertor and the comatose condition persisted during the entire interparoxysmal period, which lasted about three minutes, when another seizure would set in and follow almost exactly the same order of progression. Under deep chloroform anæsthesia the interparoxysmal period was lengthened to nearly six minutes. *The convulsions which occurred then were limited entirely to the right arm, and a few twitching movements around the angle of the mouth at the right side, with head turned to the right. The left arm remained absolutely motionless during the attacks which occurred under chloroform anæsthesia.* Upon withdrawing the anæsthetic the convulsions reappeared with the same frequency as before its administration and the seizures followed the same character as previously.

The patient died at 7 p. m. from exhaustion. There was a slight post-mortem rise of temperature. Autopsy was held one hour after death, and the following was found:

The skull cap was a little thickened; the dura was adherent to it and was distended with pia-arachnoid fluid. The dura was adherent to the pia in the frontal and occipital regions. Some atrophy of the convolutions was apparent in those regions, being most marked in the occipital lobes.

The brain was small and the convolutions appeared poorly developed. The microscopical findings from specimens preserved in alcohol were as follows:

There was very pronounced chromatolysis throughout the cortex. In many instances the cell body appeared entirely devoid of chromatic substance, nothing remaining but a vacuolated mass of protoplasm. The nuclear outline was often very deeply stained; in other instances the intranuclear network appeared still intact, but the meshes were greatly swollen. There were very many abstracted nucleoli.

Cases of typical status epilepticus recovering from status and the epilepsy itself are exceedingly rare, as the status is a true climax of epilepsy. Long interval cases of epilepsy might present this termination, but the long interval epilepsies rarely have status as we would expect. The notes in the case are briefly as follows:

CASE XVIII—Cora M., female; aged 20 years. Her epilepsy is of grand mal type since the age of thirteen. Father was rheumatic and intemperate; her mother died of breast cancer. A half-sister died of cancer of the uterus. Patient was the youngest in a family of six. She was born a normal child, but had difficult dentition; one spasm at dentition, and one at two and a half years of age occurred from "fright." She suffered from night terrors in infancy. Patient had measles and whooping cough in a mild form. Her epilepsy occurred weekly, accompanied by great prostration, physical and mental. The paroxysms occur mostly by day, preceded by aura of tinnitus aurium.

Physical examination showed nothing specially abnormal in her physique. Patient's epileptic attacks were classic grand mal. In June, 1896, the patient had typical status of moderate severity, but in July, 1897, patient had a severe attack of status epilepticus. Seventy-five severe attacks occurred in one day, followed by temperature of 105° and complete physical prostration, lasting for three days.

As no epileptic attacks have occurred since December 24, 1898, the patient is considered a cured case of epilepsy.

Another case recovering from the status and the epilepsy itself is here given. Many epileptics masquerade as such recovered cases, but are really long interval epilepsies. Nevertheless, the following case is one in point and illustrates that, although the status is the severest form of the disease, yet recoveries from it and from the disease itself are possible in very exceptional instances. No status has occurred in this case since January, 1899, and no epileptic attacks whatever since May 3, 1899. The case is additionally remarkable because of the great handicap of heredity.

CASE XIX.—Harry LeB., aged 14 years. He has been an epileptic since 12 years of age. Maternal aunt died insane; maternal grandfather died epileptic, and his mother had chorea at 13 years of age. All patient's maternal relatives died syphilitic. Patient was asphyxiated at birth by the cord being about his neck. He had no diseases in infancy. The epilepsy began a few months after being struck on the head by a baseball. No evidence of trauma exists. The epileptic attacks at first consisted of psychic or vertigo symptoms, preceded by an aura of bitemporal pain. The attacks are always attended by a loss of consciousness and occasionally by retro-active amnesia. Attacks at first were psychic, occurring once a week, and gradually increasing in frequency and severity until they culminated at fourteen years of age into typical grand mal, occurring in series of four to ten every few weeks. August, 1898, the patient, while living at home, had 13 attacks, attended by fever and marked prostration. During convalescence from the status he had a short period of post-status delirium (three weeks). After one week's treatment at home he was sent to an asylum for the insane, as is usual in such deliriums. He fully recovered from the mental affection in one month and was sent to the Craig Colony on November 11th, 1898. On November 30th, 1898, he had 13 grand mal attacks in one hour, attended by fever (103°) and stupor for ten hours. Loss of consciousness was continuous between attacks after the first four. After the twelfth attack 40 grains of bromide of potassium were given hypodermically, and the attacks ceased ten minutes after injection. An abscess ultimately followed at the site of the injection. The patient began another status period on January 10th, 1899 (see seizure record), which was aborted by the emergency prescription. The first attack of this period was but mildly convulsive and patient was conscious between attacks for the first thirteen seizures. Coma was continuous between the after-paroxysms. The stuporous stage lasted for twenty hours. The convulsive period lasted but two hours. The temperature, pulse and respiration were recorded but once (at the end of the convulsive stage). It was 102° , pulse 120, respiration 24. The patient was mildly delirious (exhaustive type) for two weeks after the status; otherwise recovery was uneventful.

The patient had no symptoms of attacks for over two years and has taken no sedatives for eighteen months. He has developed remarkably, both physically and mentally, and was employed as assistant cook in the hospital, being very proficient at his work.

It has long been a question with epileptologists whether one ought to attempt to abort individual attacks, and even status itself, once initiated—whether the cortical discharge in the fit should not be allowed to progress, in case the status attacks is in no immediate danger of killing the patient. The point is well taken. Too much attention has been paid to the individual fit to the neglect of the great causes originating the disease. In consequence of the former view, short-sighted policies in the treat-

ment of an epileptic have obtained. The newer view, that epilepsy is a continuous disease only occasionally showing itself markedly in the grand upheavals of the fit, has shown the way for the modern and broadly hygienic plan of treating the patient as well as the disease. The principle holds good also for much of the treatment in the status. Just as destructive violence and automatism may occur as the result of interfering with the progress of the individual attack, so may a too-abruptly-aborted status period end in extreme delirium or epileptic mania. This latter state, however, in most of its clinical manifestations, is quite

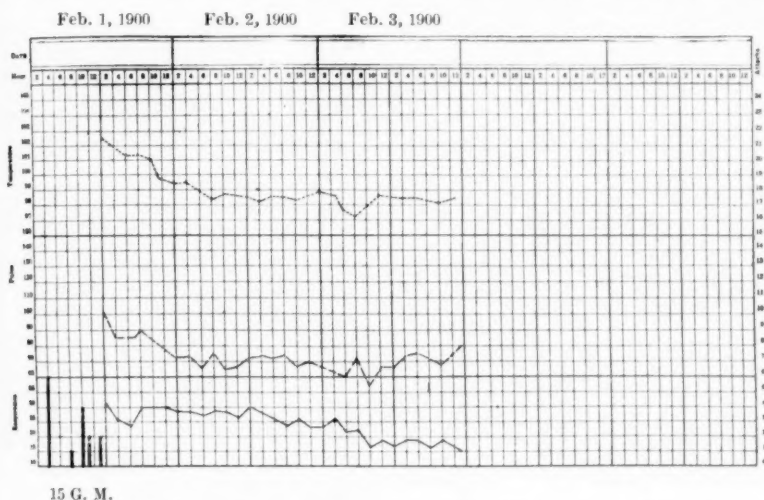


CHART XXXIII.—Wm. B. Shows the terminal state of a status, produced by but fifteen severe grand mal seizures, which was perhaps too promptly controlled by sedation and consequently a delirious mania followed.

different from the low muttering type of delirium from the exhaustion of the complete status. The following illustrative case of a too-sharply-aborted status is given to show that when the stuporous stage was abbreviated it was replaced by delirious mania. The patient ultimately fully recovered from the psychic equivalent of the stuporous stage.

CASE XX.—William B., aged 28. He was an epileptic at 14 from an unknown cause. He has had as many as 22 attacks in sixteen hours. Under large doses of bromides he has had no grand mal attacks for one year prior to admission in January, 1900, but four or five petit mal attacks occurred daily. He was in an advanced stage of pulmonary tuberculosis. On

account of the intense bromide poisoning, his sedation by this drug was reduced, and on February 1st he had fifteen grand mal attacks (see chart 33), from which he passed into a condition of coma and extreme exhaustion; the severity of the convulsive stage of the status period caused pulmonary hemorrhage. As the temperature, pulse and respiration fell, the patient recovered from the profound coma, and was restless and delirious. The delirium on the 3d changed to delirious mania with intense motor restlessness. He remained in this maniacal state until the 8th, and soon after the resumption of the normal state the petit mal convulsions returned as before the status. The treatment was by hot baths and stimulants in the stuporous period, and bromides, chloral, and morphine for the maniacal period. Since this experience with a too-abruptly-aborted status, the plan of treatment for this case, as that of Joseph A., has been largely by a continuous bromide medication in order to spread the attacks over a longer period of time than would be represented in an ordinary status period.

Another status case is also given to show a too-abruptly-abortive treatment. Almost all such aborted cases suffer a more or less prolonged period of mental disturbance; apparently such partial or incomplete status finishes with a mental equivalent; in an inverse manner an epileptic mania of great fury may be entirely aborted or cleared up by several severe seizures, as shown in the case of W. H. J., whose stupor often ended in convulsions. It is well known that certain epileptic discharges are manifested by homicidal violence or ungovernable fury and anger, in which a variety of hallucinations and delusions may be in evidence. The details of a too-sharply-aborted status case and its termination in a mild mania are as follows:

CASE XXI.—Maria B., aged 17 years; the second child in a family of five. All are living and healthy except patient. Her father had several attacks of acute rheumatism prior to patient's birth. A maternal uncle was an epileptic. Both paternal and maternal grandmothers died of paralysis (?). Patient's grandfather died of apoplexy. Grand mal convulsions at the age of three years without apparent cause. No paralysis followed. Patient had no more convulsions until nine years of age, when she had from three to seven daily (in 24 hours) at first. For the past eight years they have occurred in varying frequency and severity. At fourteen years of age patient had scarlet fever, with albuminuria as a complication. The albuminuria continued several weeks after convalescence, but entirely disappeared. No attacks occurred in scarlatina or albuminuric period. Menstruation occurred at fourteen and has continued quite regular and normal since. Attacks have a tendency to cluster about the menstrual epoch; especially is this noticeable in regard to the appearance of the serial

periods. An aura precedes attacks, and consists of a tingling sensation which runs up the left leg and down the left arm (as noted by Jackson), at the end of which consciousness is lost. Occasionally ligating an arm or leg prevents the further progress of the attack. The attacks are tonic-clonic convulsions, ending in stertor. Patient has had a mild attack of mania following a short series of convulsions, and two or three psychical equivalents or periods of epileptic fury.

On April 12th and 13th, 1900, the patient began a status period (see chart 34). The first 21 attacks were mildly convulsive; the remainder of the period they were grand mal. The comatose stage free from convulsions began at 7 a. m. At 6:20 p. m., April 14th, the patient passed into a delirium,

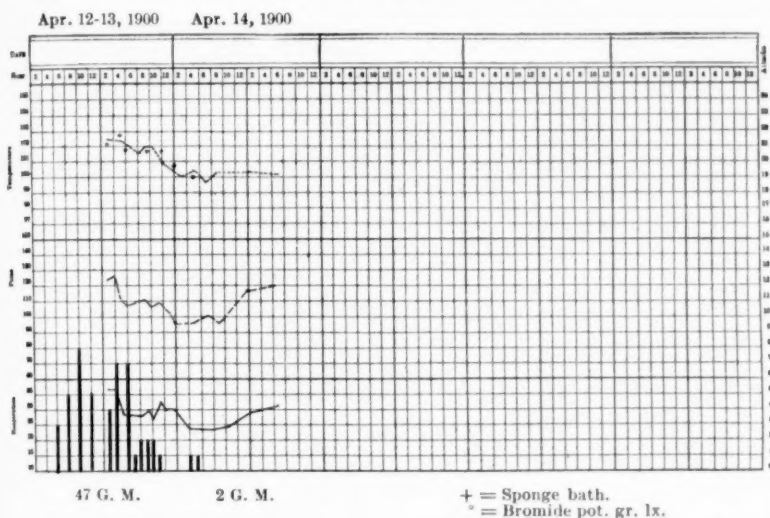


CHART XXXIV.—M. B. Shows the effects of a too abruptly aborted status which was followed by mania.

accompanied by considerable bodily restlessness, which necessitated her isolation and restraint. (Post status psychosis, or, better, a stuporous equivalent.) The delirium continued for three days and convalescence was complete in a week. To the continuous small doses of bromides which were given the patient's freedom from status must be credited. Patient remains in fair physical and mental health.

As an illustration of the manner in which status may begin and the aborting effect of treatment not too energetically pushed, the following case is given:

CASE XXII.—Carl J., aged 18. He has been an idiopathic grand mal epileptic since 14 years of age. There is a marked neurotic family history. His attacks have always had a tendency to group themselves (see seizure

account of the intense bromide poisoning, his sedation by this drug was reduced, and on February 1st he had fifteen grand mal attacks (see chart 33), from which he passed into a condition of coma and extreme exhaustion; the severity of the convulsive stage of the status period caused pulmonary hemorrhage. As the temperature, pulse and respiration fell, the patient recovered from the profound coma, and was restless and delirious. The delirium on the 3d changed to delirious mania with intense motor restlessness. He remained in this maniacal state until the 8th, and soon after the resumption of the normal state the petit mal convulsions returned as before the status. The treatment was by hot baths and stimulants in the stuporous period, and bromides, chloral, and morphine for the maniacal period. Since this experience with a too-abruptly-aborted status, the plan of treatment for this case, as that of Joseph A., has been largely by a continuous bromide medication in order to spread the attacks over a longer period of time than would be represented in an ordinary status period.

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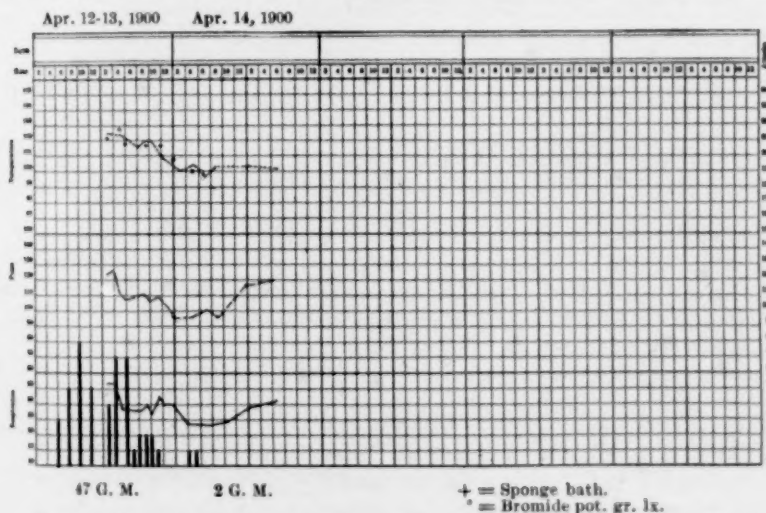


CHART XXXIV.—M. B. Shows the effects of a too abruptly aborted status which was followed by mania.

accompanied by considerable bodily restlessness, which necessitated her isolation and restraint. (Post status psychosis, or, better, a stuporous equivalent.) The delirium continued for three days and convalescence was complete in a week. To the continuous small doses of bromides which were given the patient's freedom from status must be credited. Patient remains in fair physical and mental health.

As an illustration of the manner in which status may begin and the aborting effect of treatment not too energetically pushed, the following case is given:

CASE XXII.—Carl J., aged 18. He has been an idiopathic grand mal epileptic since 14 years of age. There is a marked neurotic family history. His attacks have always had a tendency to group themselves (see seizure

table). He was severely poisoned by bromides prior to his admission, and upon their withdrawal the attacks in series became severe and exhausting. The severe attacks and their resulting stupor, as portrayed in the chart, is well shown (see chart 35). The attacks were grand mal, and a short description of the first one of the series is as follows:

The patient staggered about for a few seconds, gave a sharp cry, and fell to the left. The left great toe turned downward and the left limb slowly straightened and became very rigid. In three seconds the right leg followed in the order of epileptic phenomena mentioned in the left leg. Both arms then became involved in tonic rigidity, the order of involvement syn-

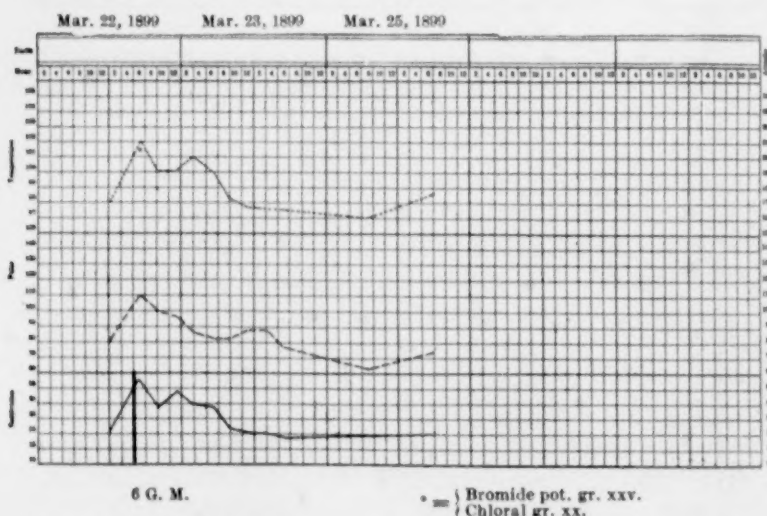


CHART XXXV.—C. J. Shows the ideal adjustment of the amount of sedation to a status period. No after ill-effects occurred from a prompt control of the status period.

chronous for both sides. The thumbs and fingers took convulsive hand position in supination. As the converse advanced they slowly pronated; the forearms then flexed extremely on the arm. The neck and face were last involved and were most convulsed on the left side; the head was deflected and rotated decidedly to the left. The tonic stage lasted for six seconds; the clonic period lasted half a minute. The convulsion ended in the left leg first, the right just a second later, while the arms did not cease convulsions until ten seconds later. The muscles last in convulsions were those about the mouth. There was a slow champing movement of the jaws, which lacerated the tongue slightly. The face was very pale at the beginning of the convulsion, then became flushed; the lips were purple; there was intense conjunctival injection, after which the four attacks resulted in diffuse conjunctival hemorrhagic patches covering one-half

of the eyes. The pupils were widely dilated; the eyeballs were turned upward and to the left throughout all the attacks.

Treatment was by the emergency prescription after the sixth attack. This patient has since been placed on continuous small doses of bromides and tonics, with marked improvement in serial attacks and physical health.

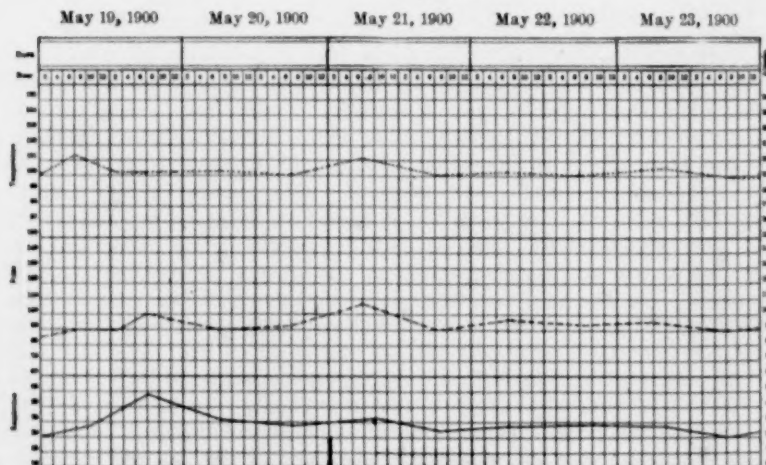
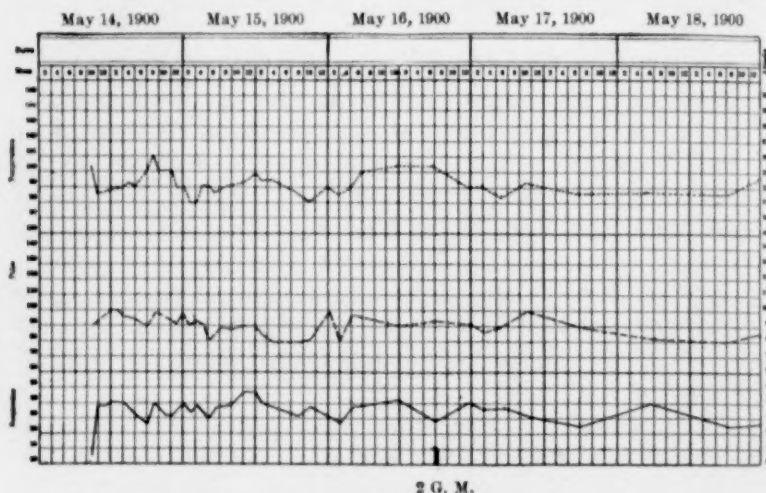
Reference to the seizure chart in this case shows that a severe status might not have been expected; therefore the amount of cortical discharge was not greatly depressed or repressed, and in consequence no maniacal equivalent was a sequel to the aborted status. It is customary in the treatment of status to gauge the amount of sedatives by the frequency and severity of the individual attacks, never to stop the status abruptly, if possible. The best prognosis is held in those cases in which there is a gradual cessation of attacks (see status paper for details on this phase of treatment).*

The following is a remarkable and unique case illustrating status of coughing and hiccough, or diaphragmatic spasm, which finally ended in true classic status and death. The details of the case are as follows:

CASE XXIII.—Devere C. F., aged 26. His epilepsy began at 16 years of age. The attacks were about equally divided between petit mal and grand mal; physical examination proved negative. Patient had "crying fits" at five or six years of age. Latterly he has had an aura of pain and tightness in the head. Prior to admission to Craig Colony, April 6th, 1900, he had psychical equivalents consisting of "crazy spells; breaks chairs, furniture, yells and bites himself." A history of 20 grand mal attacks in 24 hours was obtained. Still later (a few weeks before admission) he had but a few grand mal attacks, but "had many wild or crazy spells instead." For the first few days after admission patient's attacks were attended by fury, in which he bruised himself very severely against walls and furniture by kicking and striking inanimate objects. His feet and hands were a mass of sores from these frequent attacks and their resultant bruises. The attacks gradually increased in number and severity, and as he became weaker the patient's bodily activity and violence in attacks decreased and for several days, from May 10th to 14th, he had hiccough for several hours at a time. Finally, the night of May 15th, he developed a persistent and distressing hiccough that did not respond to treatment, although the chloral and bromide reduced the severity during their administration. The patient became much exhausted and had some disturbance

*"Status Epilepticus: A Clinical and Pathological Study in Epilepsy," L. Pierce Clark and Thomas P. Prout, *Amer. Jour. of Insanity*, Vol. LX, Nos. 2, 4, and Vol. LXI, No. 1, 1903-4.

in temperature (see charts 36 and 37). At 7 p. m. he became rather comatose and the diaphragmatic spasm increased in severity and intensity until about



CHARTS XXXVI AND XXXVII.—DeV. C. F. in a fatal status equivalent composed largely of cough and hiccough (diaphragmatic spasm). Note the slight alterations in cardinal curves, yet death occurred, probably from phrenic exhaustion. The terminal days of the charts are omitted, as they were but a continuation of same picture presented May 22d and 23d. See text.

2 or 3 a. m., May 15th, when patient became restless, but was free from spasm. The 15th was spent in a delirious stupor, but no hiccoughs occurred.

Patient slept well through the night of the 15th until 8 a. m. May 16th. At 5:30 p. m. he then had a severe convulsion; the hiccough was more pronounced before and entirely absent after this severe attack. At 8 p. m. on the 18th patient began and continued to cough all night at regular intervals of half a minute, just as he had formerly hiccoughed; the coughing continued with more or less regularity, but less frequently during the day of the 19th; at night coughing was less violent, as the patient appeared much exhausted. Attacks of coughing persisted more or less frequently both day and night except at 9:30 p. m. on the 20th, and at 1:25 a. m. on the 21st, when he had two mild convulsive attacks. The coughing was very marked before and absent entirely for two hours after each attack. Coughing attacks became frequent and severe in the early hours of the 23d. No coughing occurred on the 23d, but was especially marked and quite frequent during the night of the 23d, and the morning of the 24th. No more coughing occurred thereafter, and classic epileptic seizures returned on the 25th and continued, as indicated in seizure table, until death on June 4th. The cough was purely a reflex or nervous equivalent, as there were no physical signs on chest examination; the hiccoughing and coughing were both diaphragmatic forms of epileptic paroxysms (phrenic epilepsy). No lesions were found after death.

Status composed of pure psychic attacks of the "absence" or vertigo variety are rare, but a period of status in such cases, composed of a cataleptic state induced by one or two fits, has not been in previous reports of rare forms of epilepsy. Inasmuch as status of psychic seizures forms no part of the statistics of fatal status, it is not commonly studied or reported. This case, exclusive of the status phenomena, is still very interesting. In an epileptic career of nearly 50,000 seizures no distinct convulsive movement has ever been observed. A case of epilepsy of several years' duration, embracing entirely many thousand seizures, with no distinct convulsive attacks, is extremely rare. The case is as follows:

CASE XXIV.—Emma C., female, aged 9 years. She is diminutive for her age; her epilepsy began at $3\frac{1}{2}$ years, after an attack of erysipelas. Attacks have always been psychical, occurring from 20 to 40 times daily. Family and personal history further than the above are not known.

Her psychical attacks occur as follows: The head falls to the left side generally; there is a drooping of the eyelids. Consciousness is lost from eight to ten seconds. Very rarely there is a short stertor period of three or four breaths; usually the stertor period is a long-drawn sigh. No tongue biting occurs; the patient never falls, and is rarely automatic. Her attacks are called "fainting spells" by her companions. She has had as many as 120 attacks daily without any perceptible ill effects and without any mental

or physical prostration. Chart 38 shows a continuous psychical state, a status equivalent of psychic epilepsy. Patient remained in a dazed mental condition throughout. During this psychical status period much speculation and investigation were carried on as to the cause of the temperature and pulse changes, but none whatever was found. If the muscular activity in seizures can always be put forward as explanation for fever phenomena, then no reason can be found for the status fever in this case. The existence of a heat center of the cerebral cortex, as taught by Eulenberg and Landois, would, no doubt, be very acceptable here.

Just as soon as the common attacks of vertigo reappeared the patient aroused from the mental lethargy and became bright and active. The case might be termed psychic status, the fever, pulse and respiration curves

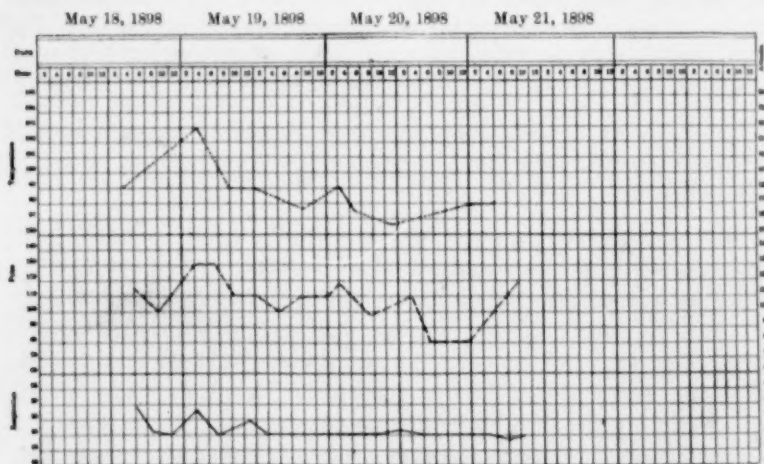


CHART XXXVIII.—E. C. Shows a status equivalent of fever, etc., of psychic epilepsy. Patient remained dazed and lethargic throughout without attacks. Vertigo attacks reappeared May 21st.

being equivalents of vertigo attacks. Yet the fever, pulse and respiratory changes did not occur at other periods of her disease whenever seizures were absent, although thorough observation was made to detect their possible occurrence, but the other free periods were not attended by the physical prostration, or other evidences of status exhaustion noted in the status period (May 18th, 1898). This case, as well as that of Louise DeR., contradicts the general impression that psychic, absence, or vertigo attacks of epilepsy are particularly destructive upon the patient's mentality; both are unusually bright and capable girls, being much more advanced in school and housework than other epileptics of their age and opportunities.

That there are nearly as many forms of equivalents for the status as there are for isolated epileptic paroxysms themselves

does not admit of doubt to one carefully studying the literature and cases illustrating the point. Many of the acute psychoses of the epileptic state attended by extreme motor restlessness, fever, emaciation, followed by stupor and death, are but other manifestations of the status. The following case of psychical equivalents forming the status period, which finally ended in death, is highly illustrative and instructive upon this phase of the status.

CASE XXV.—Mary S., an epileptic, left side hemiplegic from earliest infancy. The early attacks were both grand mal and petit mal, occurring but three or four times a year, but from December 2d, 1898, to October

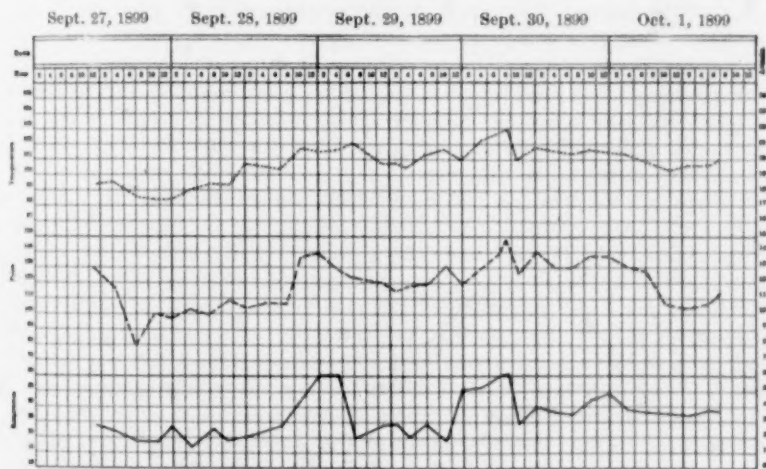


CHART XXXIX.—M. S. Shows a psychic equivalent of status epilepticus (mania). Only a part of the entire chart is here reproduced, as the final fatal termination revealed nothing more than that shown here in the period Sept. 29-Oct. 1. See text.

5th, 1899, she had neither grand mal nor petit mal, but psychical equivalents, the character of which will be given later. Her family history is as follows: Her father is an habitual drunkard and criminal against the person. The mother and all her relatives died of tuberculosis. Patient is imbecile. About once each week during the year while under our observation, and without any provocation or premonition, the patient has stripped nude, torn up all her clothing and smashed all the furniture within her reach. This has been done in the incredibly short period of three to five seconds (epileptic fury). The pupils were widely dilated and the face congested. The condition of destructiveness would be followed rapidly by that of a cunning and homicidal assault. The period of violence would last for 20 to 30 minutes, to be followed by a stupor or deep sleep for several hours; at the

end of this time the patient would return to the peaceful interparoxysmal state. No convulsive phenomena nor febrile disturbance ever attended these periods of fury.

On September 27th, 1899 (see chart 39), after an unusually prolonged destructive period of two days (the equivalent convulsive stage of status) the patient showed symptoms of exhaustion. She was restless in low muttering delirium during the night and did not sleep at all. Occasionally a slight "shudder" or "chilly trembling" was observed by the nurse, but no distinct convulsion occurred. Great offensiveness of the mouth developed, which required frequent cleaning. The "chilly trembling" and motor restlessness ceased in greater part on the 30th. Normal consciousness was lost from the onset of the fury. Now the patient entered upon the stuporous stage of the status. Swallowing became a little difficult. From the 30th to the 3d of October patient passed gradually through the grades of stupor and comatose states, which in turn terminated on the 3d in profound coma. The pulse was imperceptible at 6 p. m. and the patient died at 1:30 p. m. October 5th, 1899. Autopsy showed slight hypostatic congestion of both lungs and slight milkiness of the pia. Aside from these two findings the postmortem examination was negative.

The muscular movements in the psychical phase of the status were never sufficient in themselves to produce the fever curve, and had but little in common with the ordinary convulsive period of typical status. The onset of coma, the development of pharyngeal paralysis and the occurrence of the infrequent "chilly trembling," an exhaustive epitome of the motor restlessness, were characteristic of the stuporous stage of classic status. It was the convulsive or restless stage that presented the equivalent phase as is usual in epilepsy proper. The stuporous stage or exhaustion of isolated paroxysms, as well as that of status, rarely permits of variation; the dynamics of cerebral energy teaches us the reason for that, inasmuch as exhaustion is a negative stage of the positive epileptic discharge from the cortex.

The following case of pure psychic epilepsy has had two or three status periods, or, better, serial periods, as shown in the accompanying tables. That status composed entirely of psychic or "absence attacks" is not destructive of life, or even very exhaustive, is well illustrated in this case. Contrary to some authorities, the case presented non-convulsive psychic attacks, in which consciousness was not lost. Again, in one or two periods of status or serial epilepsy the temperature was subnormal. Finally, it is to be doubted whether we should not count all repeated psychic attacks serial epilepsy, as *consciousness is retained* between the epileptic discharges. Probably in most cases, if the psychic or "absence attacks" are allowed to progress, they would ultimately become grand mal status. This case is an ex-

ception to the rule. In other words, the psychic attacks are usually but mild attacks of grand mal epilepsy, and judging both from their character and effects they are but slight, incomplete or partial cortical discharges.

CASE XXVI.—Louise DeR., aged 16. She has been epileptic since early childhood. This patient's grandfather was insane; two brothers (twins) died of spinal disease (?) in childhood. The four children in the family are disposed as follows: One brother is idiotic; a sister is epileptic and at the Colony at present; the older brother is an insane criminal. Patient's epileptic attacks began at dentition. She began to walk at two and one-half years of age, but suffered from rickets from two to three years of age, and she did not walk to any extent until three and one-half years old. She has absences or psychic attacks, consisting of losses of consciousness from the beginning. But two or three classic convulsive attacks have occurred. In the "absences" the patient's hands loosen their grasp, the eyes protrude, and eventually become exophthalmic. Many of the psychic attacks occur with the retention of consciousness; the patient is, as it were, under the dominance of "some one else," but cannot speak or "exert her will." She is an unusually bright and capable girl, both in school and housework. A series of attacks (which by some might be called status) occurred on May 9th, 1900. The attacks were slight losses of consciousness; later she would fall and was placed in bed after three or four hundred attacks. Occasionally a little twitching about the mouth and eyes occurred. At the beginning they largely consisted of attacks of pallor. Bromide and chloroform were given, but did not affect the attacks. The whole number, 755, on the 10th, occurred from 8 a. m. to 9 p. m. The pulse and temperature and respiration remained normal throughout the entire period. No great exhaustion prevailed. During the period of 500 attacks on May 15th the temperature remained from 1 to 2° F. below the normal throughout the entire period. The status of May 15th ran a period similar to that described for that of May 9th and 10th. In these three days patient had 1,903 attacks.

The next case, presenting a period of mania, then delirium and stupor, in which extreme emaciation, bed sores and general typhoid ensued, is a good illustration of stupor, etc., acting as a *status equivalent*.

CASE XXVII.—M. E. M., female; aged 29; single. The patient's mother died of phthisis; four paternal uncles and one maternal uncle also died of this disease. One maternal uncle had paralysis, and one maternal aunt died of cancer. The patient is the younger of two children. Her brother died intemperate.

At the patient's birth the parents' ages were, mother 44 years, father 56 years. No injury or prenatal causes were discoverable, either before or at the patient's birth. Her convulsions were first noticed at about four years

of age. They gradually grew more frequent and severe until ten years of age, when for three or four years they were quite infrequent, occurring once in two or three months. At the beginning of menstruation at 14 they ceased entirely for the years 14, 15, 16, and 17; they then began to appear very frequently and were very severe muscular convulsions, occurring both day and night. The patient had measles at ten years of age, but no after effects resulted.

No cause has been ascribed for her epilepsy. The patient has had night terrors and disordered sleep since early infancy. The beginning of her seizures were characterized at their onset in early infancy by a severe pain in the center of the palm of the left hand, which extended to the shoulder in a sort of "numbness," when she generally lost consciousness and passed into convulsions proper; but during these times the convulsions were always localized on the left side and never extended to the right. Of late years this order of onset of her convulsions has been changed; the initial sensation consists of a sharp, darting pain in the left ovarian region, which extends up to the lower level of the precordia, when it passes down the left arm to the left index finger; then the convulsion begins here and extends up the arm, flexing each joint in turn, until the forearm is sharply flexed upon the arm, at which time the patient suffers complete loss of consciousness. The convulsions are now generally of classic type.

Occasionally the patient has been able to prevent a seizure by simply grasping the left arm with the right hand very firmly. Patient states that her memory has become a little impaired of late years. She has naturally been of a very irritable disposition, engaging in assaults and acts of violence on the slightest provocation. The last attack occurred July 22, 1897. The patient is quite stout and quite eccentric in her manner and conversation. During early childhood she was very gluttonous. Menstruation began at 14 and has extended over a less period of time at each occurrence since the age of 28. Patient states this is a frequent ending to menstruation in her family; several members of her mother's family discontinued menstruation at the age of 30 and 32.

December 30, 1897, patient became irritable for a few hours, then passed into delirium without previous seizures having occurred. Temperature was elevated to 102° F., pulse to 120 and respiration to 26. Delirium and typhoid state continued for two weeks. Patient had herpes zoster scapularis, confined to the left side entirely. Bed sores developed on the sacrum and heels. Temperature and pulse returned to normal at the end of two weeks' period. Emaciation was extreme. It will be seen from her seizure record that the patient remained entirely free from seizures in this period.

Treatment was by cold packs, bromide and chloral grains II, every six hours.

A comparative study of the resultant physical and mental exhaustion of status would be very interesting. In some the mental exhaustion which is manifested in delirium or delirious mania

far outruns the bodily paresis; in other cases there is but little or no clouding of the intellect; occasionally there are post-status psychoses prolonged for several weeks, resembling that of meningitides, but they are purely exhaustive in nature and not inflammatory in origin or character, as held by Bourneville. The degree of severity of the psychoses in either isolated attacks or serial or status periods is present generally in inverse ratio to the severity of the serial status periods; that is, after the slight epileptic discharges, the high instability of the brain is precipitated through a wider area and it apparently discharges to a lower level

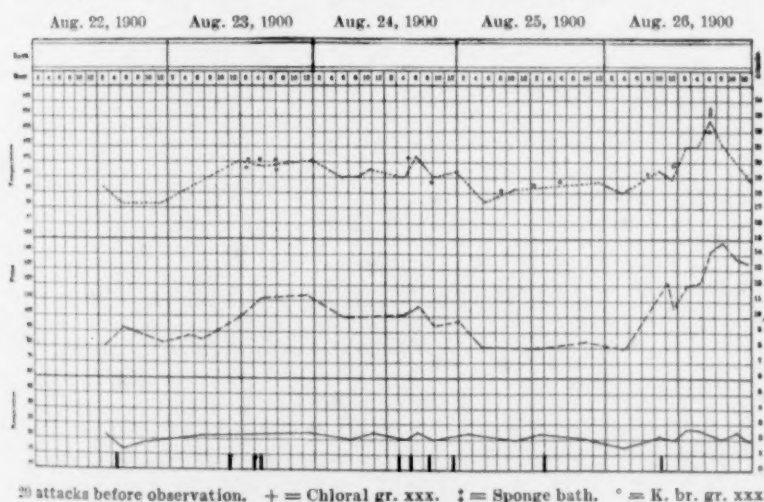


CHART XL.

by a psychosis of days' or weeks' duration. When but few attacks have occurred in aborted status the epileptic mania replacing an abbreviated convulsive and stuporous stage is violent and of an active type, quite distinct from the pure exhaustion type seen after a full course of status has been run. At times the two types are intermingled and no distinct demarcation of the two psychoses is possible.

The typical post-status psychosis is of an exhaustive character and not at all that of fury and exaltation of the epileptic mania, which occurs independent of or following isolated seizures. It disappears just as fast as the bodily and mental powers are rein-

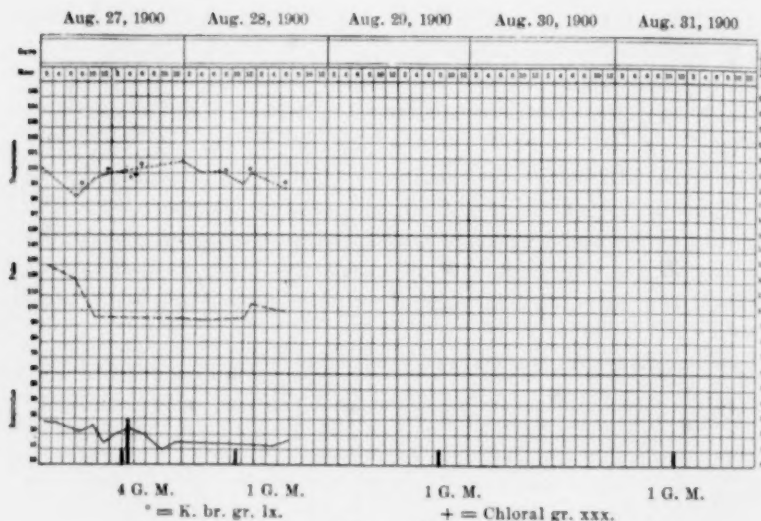


CHART XLI.

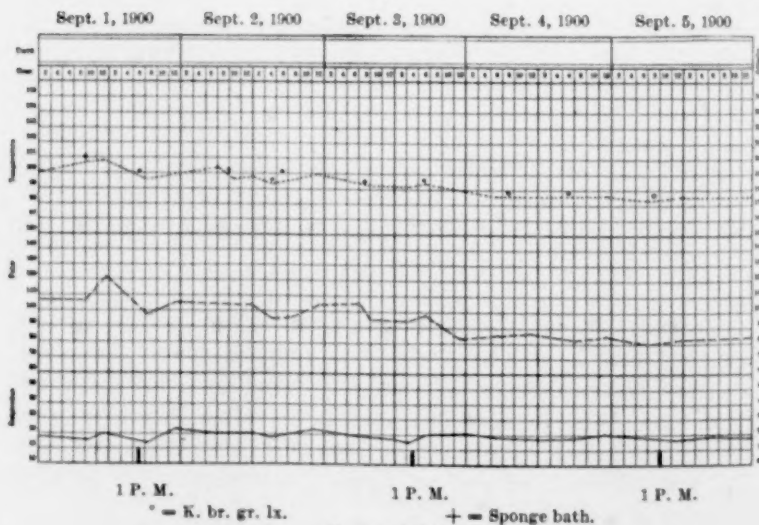


CHART XLII.

CHARTS XL, XLI AND XLII.—Katie D. Show the clinical record of a post-status exhaustion psychosis. The fits were incompletely controlled throughout. It might be called the psychic equivalent of a partly aborted status—a status prolonged and incompletely suppressed, showing its continuance by mental symptoms in place of coma and stupor of ordinary status.

vigorated by food and rest. It is a negative, exhaustive psychosis and not the positive, fulminant psychosis of epileptic mania, as ordinarily seen. A case illustrating the post-status psychosis (exhaustive) is as follows:

CASE XXVIII.—Katie D., aged 16. There is a very neurotic family history; she has been epileptic since infancy. Patient has grand mal attacks, interspersed with gastric crises, including vomiting and stomach content or feelings of extreme nausea. These attacks commonly occur in series; the series generally consist of grand mal attacks, in which gastric crises are interspersed. The status periods are attended by great motor restlessness, but in other respects are quite typical. The accompanying charts (40, 41, and 42) are given to show the post-status psychoses of epilepsy. During this period patient was crying, talking incoherently, and resisting care (epileptic befogged state?). Her rest by night was interspersed by low muttering delirium, which presented many appearances of the mental disturbance of the typhoid stage, which is Bourneville's so-called meningitic stage; this mild and restless delirium is a mental counterpart of the bodily exhaustion, *i. e.*, a post-status exhaustive stage. As soon as patient could retain food and obtain physical rest she quickly recovered. She is at present well and has had no status since.

CASE XXIX.—Relative to the insidious form of status epilepticus without convulsions in which fatal psychic equivalents of the status might be postulated, one is impressed with the case of Pick's,* in which he describes a woman, 42 years of age. Her earliest seizures, at first mild, became stronger and more frequent, with eventual spells of confusion, excitement, etc. The attacks were nocturnal in origin. She abused the use of alcohol, drinking beer, rum, whiskey, etc., indiscriminately. When aroused in the morning she performed automatic acts which were not remembered. She was first seen by Pick February 17, 1903. Nothing abnormal occurred in her case until March 21st. Probably nocturnal attacks occurred. She did not get up in the morning; her behavior was automatic; she would not answer questions, did not perceive needle prick, and there was no knee-jerk. Echolalia was present. After three-quarters of an hour or so after rising she became normal. Nothing further occurred until April 2d, when she had a similar experience, and again on April 14th. On this latter occasion the reflexes were lively, and there was no automatism save a very brief echolalia. Four days later another seizure occurred. In the morning there was some confusion. Slight paresis or weakness developed in left arm. Her tongue deviated to the right and the pupils were sluggish. Her arms remained in artificial positions, as in catatonic state. These peculiar episodes now became very frequent, occurring daily. The author is not explicit as to whether all these phenomena on waking were consecutive to

* Pick: "Insidious Form of Status Epilepticus Without Convulsions." *Wien, Klin. Woch.*, 1904, Vol. 17, p. 331.

night attacks. Some of them certainly were, at least after they became serial, but the failure to mention night attacks in the early, infrequent paroxysms probably means that nocturnal convulsions did not occur. Even after the condition had become serial, convulsions were doubtless absent to a large extent. The early morning phenomena were clearly looked on as psychical equivalents. From the title of the paper it is clear that when the case terminated in status, convulsions no longer occurred.

Early in June patient presented many of the phenomena of status, such as cyanosis, a soporous state, etc. In the midst of this the psychical attacks appeared. In other words, the case was one of psychical and automatic activity, with free intervals of passive quiescence. There were no convulsive phenomena, but at times the arms showed some tonic contraction which could be overcome.

By June 7th the patient was in a permanent stupor. Temperature went above 40° C. The condition was like that terminal for ordinary status. No further psychic attacks occurred, and death followed.

In seeking to explain the case the author thinks that nocturnal petit mal may have occurred when convulsions were known to be absent at first. The waking condition suggests in part a recovery from the past epileptic stupor. Numerous special phenomena were, however, present. Echolalia, perseveration, katatonic phenomena, sensory and motor apraxia, and a peculiar palmor reflex. However produced, there could be no doubt that the status was genuine.

The author cites the well-known fact that status may follow alternate attacks of grand and petit mal. The comatose condition which succeeds in such cases passes gradually into status epilepticus.

The author appears to find points in common between his case and Bresler's so-called spinal epilepsy, a rather absurd contention, in view of the well-known cortical character of the epileptics in general.

In commenting on Pick's case, Pilcz* reported a second case of his view somewhat similar. The details of the latter case are as follows:

CASE XXX.—Patient (private) born 1887. When five years old epilepsy began during whooping cough. Attacks became progressive, but two years later ceased after perforative otitis media. Patient was free from attacks for three years, then recurrence took place and showed the progressive type. Attacks were followed by twilight states (epileptic befogged state).

* Pilcz: Wien, Rundschau, 1904, xviii, 757.

Patient became violent in these conditions. In 1904 he had to be confined. He showed a typical epilepsy of incurable type, and progressive dementia. When under observation he showed no psychic equivalents, no pre or post-convulsive twilight states. No improvement took place under treatment. Between seizures he was able to divert himself by reading, billiards, etc. Attacks had become frequent, daily, but not serial or overlapping. At this stage patient passed at once into coma, from which he never awakened.

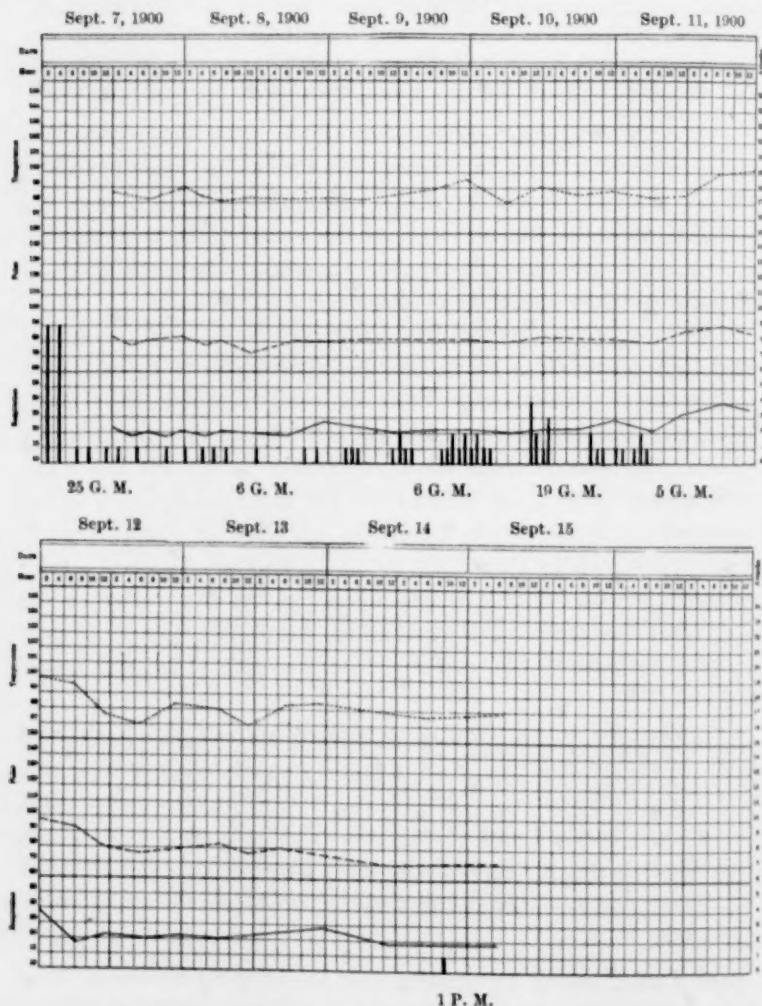
We have severe epilepsy, frequent attacks, passing at once into coma. When the latter supervened the attacks had been even less frequent than at an earlier period. In other words, one would have said that the patient was on the mend. He was coming quickly out of his fits, and psychic phenomena and evidences of dementia were no longer in evidence.

It does not appear certain that Pilcz claims this case for one of status, yet it doubtless bears definite relationship to it, as shown in my cases of psychic equivalents for status just detailed. Acet-onuria was present as a possible cause of coma, but this may be explained by inanition, for the patient went nearly his last week without nourishment, an observation not infrequently seen in the prolonged stuporous states of status attended by extreme emaciation, as shown in Case IX (W. H. J.) of my records. Pilcz comments at considerable length upon the extreme rarity of the case. My cases are contributions to his contention, being the only ones I have observed in a very large material of several years' study.

For the sake of differential diagnosis the following case of status in major hysteria is of interest. Although some degree of rise of temperature is seen in status of hysteria major, some authorities (Gowers and Féré) notwithstanding, yet it is not generally extreme, not more than one or two degrees, and certainly not proportionate to the number and severity of the paroxysmal symptoms.

CASE XXXI.—Agnes C., female, aged 32; a deaf-mute dating from scarlet fever at five. Hysteria diagnosed as epilepsy began at 26; attacks were paroxysmal at the outset and all occurred at night, and once a month at the menstrual epoch. Patient complained of pain in the left ovarian region, and globus developed just before convulsions began. Patient had always suffered from dysmenorrhea. September 7th, 1900, patient began her first period of status hystericus; it continued three days and was followed

by a slight rise of temperature on the third day (see charts 43 and 44). On September 10th the stuporous stage was followed by delirium, which disappeared in three days. After a prolonged period of serial convulsions



CHARTS XLIII AND XLIV.—Show the status of hysteria major. Note the very slight alterations in cardinal curves in sharp contrast to that of the status of grand mal epilepsy.

and status hystericus a double ovariectomy was performed. Both ovaries had undergone cystic degeneration. Mild hysterical convulsions have recurred

Another case of status hystericus may be given as a typical case of its class, to show the very marked difference in the fever, pulse and respiratory curves as compared with those of true status epilepticus. The case is additionally interesting as the patient, who was always very neurotic, undoubtedly contracted her major hysteria from association with her sister, who suffers from *true epilepsy*. The case is as follows:

CASE XXXII.—Ida N., female; aged 17 years; occupation, tailoress. Her convulsions were supposed by relatives to be epilepsy and she was therefore

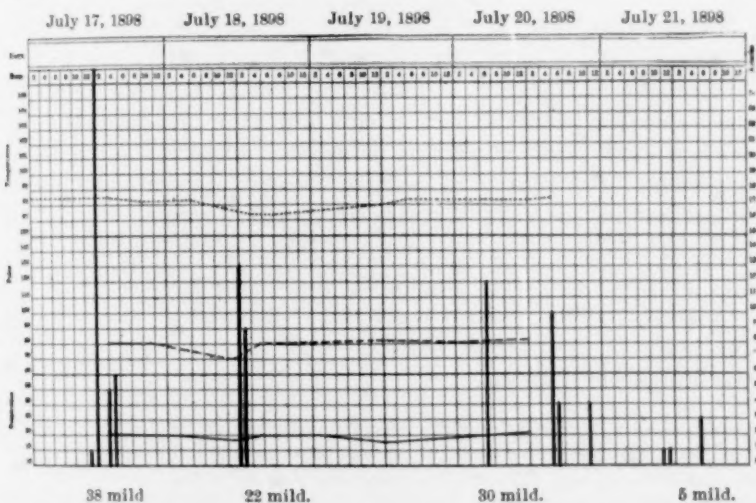


CHART XLV.—L. N. Shows a classic status hystericus. Note the sharp contrast between this chart and that of the cases of status epilepticus.

sent to Craig Colony. The attacks were serial from the beginning of the disease, a rare beginning in true epilepsies without organic basis. The convulsions had existed for three months prior to coming under my observation. Patient's father was inebriate; her mother was syphilitic, and died at the menopause. One sister, aged 20, has been epileptic for four years and is now insane. Her paternal cousin is epileptic and insane. Thus the ancestral neuroses paved the way for our patient's hysteria. Patient is the youngest in family of three. Two years ago she had repeated attacks of hysterical epistaxis. She has had scarlet fever, whooping cough, and measles, with no ill effects. Patient had "jerking spells" while in school some time ago. She undoubtedly contracted her major hysteria from associating with her sister, who has classic grand mal epilepsy and is a patient at the Colony also. Our patient is sometimes said to be automatic after the hysteric attacks. She is conscious in isolated attacks and has

general tonic convulsions, followed by passional attitudes. No stertor or sleep stage follows these convulsions, but loss of consciousness occurs when the attacks occur in series. The diagnosis of our hystero-epileptic nature as differentiated from true epilepsy is well proven in a status period shown in the chart (45). *Consciousness is lost between paroxysms* in the status hystericus; coma and exhaustion are extreme for a day or two, but they are not at all proportional with that seen in and following status epilepticus. In the status hystericus just given the convulsions were so characteristic that a diagnosis was not difficult on the type of seizures alone. The periods, August 29th-September 6th, September 9th-11th, and October 11th-14th, were identical in general character with that of the July period just given.

Still another case of status hystericus may be profitably incorporated here to show the interesting occurrence of the *bleeding stigmata* of hysteria. A faulty diagnosis of epilepsy obtained in the case for years; in fact, it was only after the patient came under trained observation that a definite diagnosis of hysteria was made. The case is of peculiar interest, as the uncommon, but not unique, *bleeding stigmata* of hysteria obtained frequently in status periods. The symptom or phenomenon was disposed of by previous observers diagnosing the condition as epilepsy on the ground that the hemorrhages were vicarious or hemorrhage equivalents of the comitial disease. Careful study has ruled out these untenable theories.

CASE XXXIII.—Nora L., aged 20. She has had major hysteria from childhood; she has been addicted to masturbatio nand alcoholic excesses since 12 years of age. For several years she was immoral. Family history neurotic and criminal. From 14 to 20 she has been addicted to morphine, camphor and illuminating-gas inhaling. The night following admission to the Colony on July 1st, 1898, she had two severe general convulsions (major hysteria) that lasted thirty seconds, and were accompanied by profuse bleeding from the mouth and eyes (bleeding stigmata). The blood was of a pale red and quite thin. It seemed to issue or ooze from the eyelids and form clots in small droplets as soon as it flowed from the lids. The bleeding lasted one-half hour. The skin just below the eyes was an intense red color, but not hemorrhagic. The capillaries in and around the orbicularis palpebræ were distended to the fullest extent. Great exhaustion followed the attacks. Four days after, in a slight attack, the bleeding from the eyes began at the onset of the convulsions, and the bleeding continued for five minutes; nothing but a bloody froth issued from the mouth at this time. Attacks for the next six months occurred both with and without the bleeding stigmata, their absence and presence being about equally divided. Attacks cluster in series about the menstrual period, which is irregular both in time, character, and amount. At this status hystericus period the

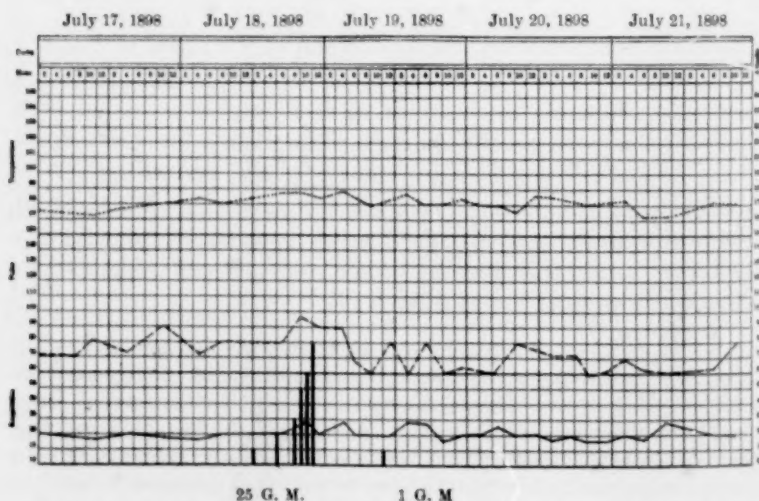
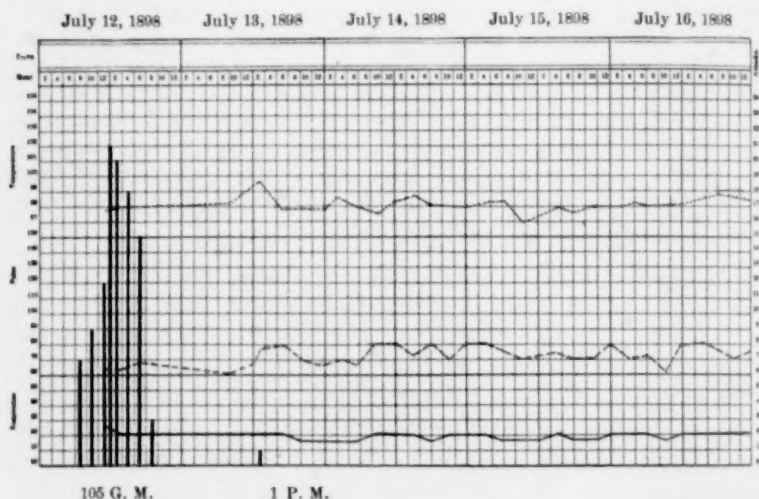
patient takes passional attitudes and there is a bilateral foot and hand movement synchronous and rhythmical on the two sides, but not as regards the upper and lower extremities. Whenever extremely vexed she is liable to status hystericus. Several times hemorrhages have occurred both from the axilla and mammary glands. Hemorrhages were most profuse of late from the mouth. Patient is very anæmic after status. Under normal and hygienic treatment the hysteria has improved, but the patient is congenitally criminal in tendencies, and were she to recover from her major hysteria she would still be far from well or normal. Patient was removed from the institution by relatives July 24th, 1900. No temperature alteration ever occurred in patient's attacks of status epilepticus.

Does hysteria and epilepsy ever occur in one and the same case? For many years the association of the two diseases has been a much-mooted question. No doubt most cases of its reported occurrence may be disposed of by classing the observations as one or the other disease in their many and varied forms. However, there are cases seen occasionally in which the diagnosis must at least remain in doubt. Of course there can be no valid reason why the two diseases may not be associated in the one case. No two nervous diseases are mutually exclusive. I have never seen, however, the association of the *status* of epilepsy and the *status hysteria* in the one case, but wish to present here a case of hysteria in which *status* of hysteria has occurred with *isolated* paroxysms of true epilepsy. The patient has had *several attacks of status hystericus, but none of status epilepticus*.

The isolated convulsions are classically epileptic, while those of the serial or status periods are of major hysteria. The patient is recovering from the hysteria, while the epilepsy remains unchanged. The notes are as follows:

CASE XXXIV.—M. S., female; aged 14 years. Her epilepsy began at 13 years. Her father was intemperate and of dissolute habits. Nothing further is known of her history. During the month of June, 1898, patient had serial attacks for three or four days, and on the 14th she had 33 grand mal attacks of major hysteria within a few hours. There was no coma between attacks; no elevation of temperature; no alteration of pulse, nor depression following. Each day of this series she had paroxysms with stertor following, but no disturbance occurred in temperature or pulse. She did not seem especially weakened by her severe or frequent convulsions. Patient continued to have serial attacks of hysteria and had 105 in one day, July 12, 1898 (see charts 46 and 47). On the 29th patient had an attack or period of deafness which lasted from Wednesday night until the following Friday at 1 p. m., when she had a very severe convulsion (classically epileptic) pre-

ceded by cry and fall, tongue biting, and passing of urine. Her hearing was restored after this fit. At the status period of July, 1898, the serial or



CHARTS XLVI AND XLVII.—M. S. Show another classic attack of status hystericus in an individual both epileptic and hysteric. No status of epilepsy has occurred in this case.

status hystericus began at 8 a. m. and lasted until 2 the next morning, without intermitting more than a few minutes. No pulse or respiratory elevation occurred.

Her hysterical attacks are described as follows: No subjective aura; no apparent tonic convulsion; general severe clonic convulsions commencing in the orbicularis palpebræ and muscles of the upper and lower extremities. The left side is involved a little in advance of the right; the fingers are flexed with the thumb over them, a position not commonly taken in epileptics. The general convulsion, which is clonic throughout, lasts about a quarter of a minute. There is no discharge of saliva; no tongue biting. The pulse after such an attack as above described registered 64°, full and even; respiration 24; temperature in the axilla 97.8° F.

April, 1901, the patient has markedly improved physically and mentally, and has had no great status hystericus period since November, 1899, although the epileptic attacks remain classic, still they are not so frequent or severe. The case history undoubtedly shows an association of hysteria and epilepsy.

In conclusion of this clinical study of the aberrant forms of status epilepticus, one is impressed that there are as wide departures from the classic forms of the climax of the disease as in epilepsy proper. Inasmuch as status cannot be considered a disease entity, being but one phase of the comitial disease, it is composed of as widely different elements as mere loss of consciousness to that of classic grand mal.

If we were but sufficiently impressed with the fact from this clinical study that neither a Jacksonian convulsion nor a sequential paresis warrants one in classing the individual case as an operative one, and that without more definite data the case may still be an ordinary idiopathic epilepsy disguised as a focal epilepsy, the tediousness of studying these clinical reports will not have been in vain. Even though our ultimate pathological knowledge shall prove many of these cases to be old focal encephalopathies or an embolic or birth hemorrhage, surgical repair in such will not be less difficult. The need of the refinement of operative interference on cerebral tissue, confining the injury to parts incised or excised, finds no greater field in neurological surgery than in the epilepsies. The surgeon may perhaps as justly retort that the frequent failure of relief in focal epilepsy by surgical means is due in no small part to the neurologist's too ambitious desire to relieve a wide-spread cortical disorder in which a mere focal intensity of disease expression happens to exist.

Some of the cases here presented certainly go far to either disprove Wernicke's relative diffusion theory of cortical discharges in fits (*i. e.*, a muscular march from face to arm and leg

of one side, etc.), or to prove that there are two or more centers or foci of disease in the epileptic brain. The latter view seems to me the more tenable theory upon which to explain the type of convulsions such as seen in cases XIX, IV, and XV.

It is interesting to note that not a few cases of the anomalous status here given show exquisitely the opportunity of studying the varying orders of muscular march in the fit, as exhaustion of status in the particular case increases. Many an idiopathic epilepsy reveals the focal cortical intensity or storm center in the disease in its initiative and dominance of the convulsive picture. In the status of such a case it is as though the bewildering and rapid succession of muscular march were slowed by the exhaustion, so that one might study the component convulsive succession of cortical discharges. In time some practical therapeutic procedure may be based upon a more definite knowledge of the laws underlying such a disease expression. A study of fits has been a means of signal advantage all over the broad field of neurology, a trite and unnecessary reminder here, if it were not so little heeded. The tragic terror and the obscure neuropathology of the individual fit still hold the mystery of many a nervous disorder as well as the grand climax (status) of this strange disease.

It is hoped many of the aberrant forms of status seen in the equivalents composed of psychic attacks, maniacal excitement, stupors, cataleptic states, somnolence, and imbricated convulsions, such as coughs, hiccoughs, vaso-motor phenomenon, etc., the sequella of transient sensory and motor palsies, rigidities, local and general postmortem rise of temperature, exhaustive deliria, etc., reported here, may excite renewed, more intensive and exact study of the status in the many colonies and institutions now in more or less successful operation in this country and abroad. No modern or extensive study of the condition has now appeared for a decade. I can but repeat, if it be determined that there is a more or less definite destructive lesion in the epileptic brain after one or several hundred seizures (status epilepticus), the mechanism of the last attack being usually identical with the first, then there must be the same nervous elements involved and diseased in the morbid mechanism from first to last. The cerebral lesion in epilepsy proper must therefore be in those elements found ultimately damaged or destroyed in the status epilepticus.

The foregoing paper is offered as a contribution to aid in the accomplishment of this end.

While the anomalous course of any disease or syndrome inherently lies in the nature of the disorder and the physiologic pathology of the tissues involved, these two factors fully considered fail to give much real insight into the clinical anomalies of the status as herein detailed. When we take into account that the status is but the climax of a variant degenerative disorder of the cerebral cortex, we readily understand that the ordinary variations of epilepsy are here but writ large in the clinical study. Then, too, the psychical and physical exhaustion and the general derangements of all bodily functions in such a destructive phase of epilepsy as the status contribute no small part to the distortion of the ordinary type of status with simple convulsions and coma. The phenomenon of elimination of waste alone, as shown in the status, has not been properly studied. The autointoxication resulting from the absorption of these excess products can but produce an enormous distortion of the cardinal curves shown in the status records. No small part of the change in the therapeutics of the status has come about from the consideration of the toxic effects of animal experimentations of the blood of status patients. As in ordinary epilepsy, less attention is being given to the control of the convulsions, and more to combating exhaustion and so-called autointoxication in the status. We now employ cathartics in enormous doses (3 or 4 oz. of castor oil at a time), saline transfusions to wash the blood after blood-letting, and frequent colon irrigations and oxygen inhalations are given to decrease the asphyxia and its evil results on the heart and kidneys.

I shall not mention any of the phases of the drug treatment of the status here, as I do not believe any signal advance in this direction has taken place since my chapter was written, several years ago, in Spratling's text-book on epilepsy. There can be no doubt, however, from the foregoing clinical reports, that sedatives need to be given with great caution, as their injudicious administration contributes in no small degree to the fatality of status in many cases.

Lest some who read these clinical reports may gain too pessimistic views regarding the recoverability of epilepsy in which status occurs, I may say that in the past ten years, in private

practice, I have known three of my severest cases of epilepsy with status attacks to enjoy complete remission or cure from any manifestation of the epilepsy for three, five, and eight years, respectively, and this, too, occurred without sedative medication being employed. One patient had as many as 120 grand mal attacks a day and fever of 105° during the status. It must be said, however, that all of these recoveries occurred in cases of short duration and in which no mental changes had taken place. They were, by all strict tests, however, true epilepsy as ordinarily considered.

CONDITIONS IN SOUTH CHINA IN RELATION TO INSANITY.*

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In order to understand psychopathic conditions of any land it is necessary to know the habits and customs of the people; conditions in which they live; and to have some conception of what they are thinking of. I shall try to present some of the most prominent of these existing in South China.

CHILD-LIFE AND MARRIAGE.

The Chinese are very fond of children. Especially is this true of boys, as they remain in the family to worship the spirits of their parents and their ancestors. The women's very strong desire especially for boy children has an additional ground in the hope of gaining the good-will of the husband and his family. The coming of a male heir is heralded, therefore, with great delight. Not so with the girls. They go away to live in the other man's family and to worship his ancestors and are, therefore, of no lasting value to their own.

The boy is petted and indulged, allowed to do almost anything he wishes and is served by the whole family. The girl is little petted and has to serve the whole family. If the parents are very poor she is not much wanted. In some cases she is thrown out, or neglected and dies. In very many cases she is taken care of as a matter of policy, looking forward to the time when she can be sold for enough money to repay all that has been expended, and more, in buying her rice. Again, however, many girl babies are loved and cherished and grow up with their parents to love and be loved.

Daughters are always practically sold to the men whose brides they become, be they rich or poor. They bring sometimes very high prices; but this, of course, is regulated by their attractive-

* Read at the meeting of Ward's Island Psychiatric Society May 26, 1913.

ness, as also by the amount of rice they have eaten, as intimated above. A patient who recovered in our hospital was offered for sale by her husband to anyone who would pay one hundred dollars; another could be had for nineteen dollars. The former was a nice looking woman, the latter not so. Beautiful young women are sold for many hundred dollars; and I might say right here that there are, among the women from cultured homes, those that are really beautiful, just as there are very handsome men.

It is a common practise among the poorer people to sell little daughters in tender age for one of three purposes—to be betrothed to a boy; to become a slave girl in some family; or to life in a brothel. In the first case she goes to live with the parents of the boy, grows up with him in the intimacy of the home; must in weariness of body and bitterness of soul serve the new parents as well as the boy until of marriageable age. The first thought is to raise a son. Unhappy indeed the family where there is no male heir. If the girl proves to be sterile she is not greatly beloved, indeed often hated. If she repeatedly gives birth to girl babies she is sometimes cruelly treated, but if she can present her lord with a son, happy indeed is her position.

If she be sterile, the husband will, if he can possibly afford it, buy himself a second wife or, more properly, a concubine, because the first one continues to be the wife and any children that the concubine bears belong to the wife as her own. The real mother of the man's heir becomes naturally his beloved, and oh! pity for the poor childless wife! And also pity for the young interloper! There is the grief and shame at being childless; sorrow at losing the affection of the husband; jealousy of the new-comer, all in the deepest heart of the wife; and for the concubine, the smarting that the lash of jealousy alone can inflict. Then comes the interference of the husband for the second wife against the first. Is it strange that unstable minds are upset? And, not only may there be one concubine. We had in our hospital the wife of a wealthy man who had beside her nine concubines. But, one thing is admirable. Betrothal is considered sacred as marriage, and very seldom is it disregarded.

The girl may be sold to be a "mui tsai" or slave girl in some family. Here she does all sorts of menial work but lives in the

family. In some cases she is kindly treated and is very happy; in some she receives little consideration, and in many her lot is very hard indeed. Where there are growing boys in the family a great temptation arises in the sexual life for herself and for them and indeed for the husband. She serves the family until she arrives at the age for marriage, when she is sold to become some man's wife or concubine. She may, indeed, during her girlhood, pass several times into other hands until all family history is lost and, indeed, all personal history up to the time of being taken over by her present owners. Herein lies a great difficulty in making a diagnosis; because in very many cases of women it is impossible to get any history whatever of early life and family. The women very often remember nothing of their parents, having been given up by them when little children.

Another fate may await the poor girl either while yet in very early childhood or at any age,—that of being sold into brothel life. Here she exists for a few years and dies in misery. Her body is placed in a cheap box and buried under a few inches of soil, so little that the dogs (which in China must scavenge for a living) can easily uncover and devour it. Such is the history of a great many of China's poor daughters.

Blind girls, naturally mostly to be found among the poor, are thought to be of only one use. Many poor parents are glad to get rid of them by selling them to old women who lead them out after dark through the streets and rent them out to men for the night; and cruel those mistresses are to their helpless slaves. I can conceive of nothing darker in this world—darker in the sense of ignorance—than the mind of one of those poor, blind girls of China—not able to see one of God's created things; hearing nothing but the language of the brothel and feeling no touch but the hand of lustful men and women. And yet it is not their own sin. They are absolutely helpless in the hands of others.

Several schools are now open for receiving little blind children while still so young that they know nothing of this life, and here they grow up into pure and happy girlhood and are taught to read and write—using the adapted Braille system—to knit and do housework, etc. Last summer the excellent head of the police in Canton rescued 70 little blind girls under 10 years of age from the flower-boats and brothels of the city and entrusted them to

a lady missionary physician, who for many years has been conducting a school for blind children in that town.

In all which I have said it will be noticed that the fate of the girl children and of girls and even of the married women, is in the hands of others than themselves. I believe few girls lead such a life from choice. It must be said that the women of China are chaste, and in self respecting families the girls are very carefully guarded.

Another source of family trouble, which contributes toward cause and perpetuation of mental ailments in China is the custom of the making of marriages by the parents or guardians without the concurrence of the young people themselves, often times, indeed, in very early child life. This has been the source of untold domestic unhappiness. Young people may not be fitted for each other at all, and may have even at the outset no love or respect for each other. Sometimes the contract is made after the young people are grown up. They do not see each other until the ceremony is over. Think of the heart-sickness on finding one's self bound for life to an insane person, an imbecile or an opium sot, or even to one so mean-tempered that love and respect can find no hold, without having one word to say in choice of one or another.

As illustrating one of the disadvantages of getting married before bride and groom have seen each other, the following incident will suffice. After the nearly simultaneous death a few years ago of the emperor Kwong Sui and the empress dowager an edict was sent through the land from Peking ordering a period of national mourning of three months' duration. During that time heads must be left unshaven—putting the barbers into a sad plight—comedies were forbidden in the theaters and festivities of every kind. Marriages must be postponed. However, in order to circumvent this measure, couples whose marriages had been set to take place during that period hurried up and were married within the very few days remaining before the mourning was to begin. It so came about that two such ceremonies were to be celebrated in Canton in the same street and quite near together. The ceremonies took place rightly enough; but, on the second day when the veils were lifted so that the men might see the faces of their brides, it was at once noticed by the makers of the

matches that there was a mistake. It developed that the young women had each been carried to the other man's house and each married to the other's betrothed. What could be done? There was great confusion and lamentation. An official was consulted and he settled the matter by ordering that each bride remain as she was married.

The Chinese are much inclined to connect insanity with sexuality, thinking the natural sexual instinct must be satisfied. Whenever an unmarried person becomes insane, the family is very likely to try to get him or her married at once. But I remember one case where, after marriage, when it was found that the wife was insane, the husband succeeded in getting back the money he had paid for the woman and returned her to her parents who brought her to our hospital. I have not known of any case where there was redress for a poor, victimized bride. Of course the issue of such a marriage as the above is almost sure to be in part mentally weak or insane and to perpetuate its kind, although no doubt we shall find it true here as elsewhere that there is an attempt of Nature to eliminate the bad element.

MAKE-UP.

I have already explained that in the case of women, even of those who are brought to us by the family or friends, it is usually impossible to get a family history or, indeed, very much of the personal history. Add to this that something over one-half of all the people are brought by the officials, that these men and women have been picked up on the streets of Canton and Hong Kong, and that they come with no family or personal history whatever and not even with a history of their psychoses, and it will be easy to see that the question of *make-up* is a difficult one to study.

To us foreigners, the Chinese seem to be, as a people, "shut in." We who are intimate with them and have their love and confidence know much more about their inner selves than those foreigners can who meet them only at arm's length; but even to us who know them best, the Chinese mind is still a puzzle. I heard of one man who had lived there in intimate contact for years saying that the longer he knew them the less he knew them. To us they are of a shut-in nature. But it would be hardly right

to think of them as shut-in among themselves; they seem to be remarkably able to read each other's natures.

Generally speaking, the women are chaste, it is true, but according to our American standard of refinement, even they in their conversation are exceedingly indelicate. The men as a whole are very far from chaste. The most common expression used when one is angry and, indeed, on all sorts of occasions, is one of as vile language as can be conceived. This one hears at any time, on the street or in the shops, or even in the houses, before the women and children and without any apparent attempt to suppress it. Little children shout it at their play and even laboring women at their work, without being abashed. The children are accustomed from earliest years to hear sexual matters mentioned and joked about. The language which we would keep for the bedroom or the doctor's office is used in public with very little embarrassment. In Canton, early in my career, a young lady, the daughter of a man of large means, came to see me about herself. As was proper according to the Chinese custom, her mother accompanied her, but also many besides—younger brothers, little slave girls and grown up servants both men and women. All were present in the room when the mother began telling me of the girl's complaints. I asked the mother to come to the other end of the room apart from the others, in order to ask in a low voice about certain conditions, thinking it indelicate to talk of such matters before so many of the household. To my surprise the mother talked, without the least hesitation, in a voice audible anywhere in the room. There being little taboo upon private matters in conversation might seem to effect in some measure the development of dementia præcox, by cherishing a frankness in the minds of young people; but, in fact, this disease is very prevalent. Indeed it is one of the most prevalent forms of insanity which we find. It must be remembered here that while there is no prudishness, and even to the degree, according to our standard, of being very indelicate, there is yet no freedom (or has not been until recently) in social intercourse between the sexes outside of the family.

DEMENTIA PRÆCOX.

We have all the forms of dementia præcox common here. I could give you many cases of the catatonic form; for example,

that of a woman, the wife of an official, who has been in the hospital something like twelve years. Every few weeks she passes into a very characteristic, deep, catatonic stupor, in which she neither eats nor drinks and passes nothing from either bowel or bladder for a period of four or five days at a time; every function, save those of heart and lungs, seems to be stopped. She comes gradually out of the stupor and, after several weeks' time, will dress herself, feed herself, be cleanly and agreeable, and will even sometimes do sewing; but she soon falls again into the stupor as before. Such has been her history for twelve years at least. She is distinctly demented. I could tell you of a young man who considers himself expectant viceroy of the two lower provinces of China. He was arrested for offering violence to the soldiers who opposed his entrance to the viceroy's palace. He has been in the hospital for several years, having come in before the death of the old empress dowager. He thought he was to be appointed to the viceroyship of these provinces and awaited daily news from the empress dowager to that effect. An interesting point in the history occurred when the old lady died and the new boy emperor was put on the throne. I told him of it, wondering what would be the result. He showed little feeling in his face and simply said: "Well, I will only say I shall try to serve the new emperor just as faithfully as I should have served the empress dowager." The allegiance was transferred but the delusion persisted.

Masturbation is very common among the men. One Chinese physician told me he thought that every boy who grew up to manhood practised it. We find some of the women in the hospital also addicted to it; but there is a custom among the Chinese which naturally might tend to prevent it among the women. Every woman wishes to get married and to become a mother, but if it is found by the husband that she has been interfered with the woman is sent back in disgrace to the parents and no mercy shown. The roast pig which is carried with the marriage procession goes back with her through the streets and thus she is branded before all the people as an impure woman. On this account one would think there would be very few girls who would run the risk of preparing the way for their own public disgrace and the wrath of their parents or mistresses by practicing masturbation.

Another characteristic common among the people other than the scholars is the strong belief in ghosts, the spirits of departed ones, of which they are greatly in fear. This superstition plays a large part in the life of the people. For example, it is only possible to get a boat to transport a very sick person by paying a large amount of money. I speak of boats because they are the only means of conveyance we have there in which one can lie down, and I have had personal experience in the matter of carrying bedridden patients. The boat man is afraid the patient will die on the boat and that the spirit of the departed will torment him and his family. Houses stand empty for a long time after there has been a death even from a common cause, because no one wishes to rent such a house. If one wife dies, the rest of the wives will likely move out; they have probably had trouble with the departed one while living and they do not wish to be tormented by her spirit. This belief goes so far that it occurs sometimes that a man wishing to bring revenge upon his personal enemy and not being able to do so, will commit suicide at the door of the enemy in the hope that his ghost will have opportunity to torment him whereas in life he could not. Thus, also in insanity, the most common visual hallucinations are those of ghosts and the reaction is that of fear. Now, this superstition might not have much to do as a cause of insanity if it were kept for the grown-up people, but ghost stories are most unwisely and very generally told to children in early years, so that they grow up in great fear of these spirits, and are sometimes dreadfully frightened when people try to make them behave by telling them that the spooks will come and take them away, etc. This habit is practised in some cases in our own home lands also by unwise people, but in China it is very much more common. It seems to me this might mark an episode in a child's life which might have far reaching effects for evil in the mental life.

We have in Canton and elsewhere a large number of beggars; there is a beggars' guild, just as there is a coppersmiths' guild, and a coopers' guild, etc. These beggars are a sight to behold. I cannot conceive of human beings more dirty and repulsive in their persons, with long, matted, tangled hair, a collection of rags tied around them for dress, or encased in a discarded piece of matting, sitting by the roadside picking out the vermin from

their rags and holding out their baskets for cash. This life they choose deliberately, because they are largely able-bodied men and women. I think they must be made up very largely of the anergic dementia præcox type. There are a great many of them in the city. We see them as we walk through the streets begging food or begging cash. They are an established institution; the people have no way to prevent them from begging; they stand right in the doorway of a store until they receive a cash. The shopkeepers provide themselves with a special kind of cash which they throw to them to get them to move on. It is worth only one-half as much as common cash, and they call it "beggar cash"; it is used only for them. It is worth $1/40$ of our cent. The fact of their being satisfied to exist in this way, even though there are no other special symptoms which we are accustomed to associate with dementia præcox, and which would lead the police to consider them fit subjects for the lunatic asylum, the fact of their absolute lack of energy and ambition, with no concern for the world about them, is enough to brand them, in a very large measure, as cases of premature dementia.

STANDARD OF INTELLIGENCE.

In determining the standard of intelligence, we have difficulties which hardly exist here in America. Very, very few women read and write. Until within a few years it was not thought that it would do to educate them. Public feeling has now quite changed. Until a few years ago the Christian Mission Schools were almost the only ones in the country where girls could study. It would come about sometimes that a brother who was fond of his sister would teach her to read and write. Again, wealthy fathers sometimes engaged a tutor for all his children, both boys and girls; but those who had learned in this way might be almost entirely neglected in summing up the number of women. Even very many of the men cannot read and write; and when we consider the study of other subjects than literature, scarcely a school existed up to a few years ago where these were taught, excepting the Christian Mission Schools. Thus it will be understood how difficult it is to determine, by any regular standard, the intelligence of either a man or a woman. It must be based upon ability

to learn a trade, to keep the house, carry on business, keep from being cheated, and yet to cheat the other man, and to look out for the safety and comfort of self and family.

THE USE OF ALCOHOL.

The Chinese make both a weak and a strong wine, but they use it very sparingly. It is only at the New Year season that the people drink to any excess, and then it is in their homes. I was in China twelve years before I saw a drunken Chinese person. Until within a few years, as far as we can judge from the cases brought to us, alcohol could be practically eliminated as a first cause of insanity. That is, we had practically no cases of alcoholic psychoses. But, within the last few years we have had a few. One of these was a man from the country who had been accustomed to drink the native wine to excess. He was brought to us after pushing his innocent wife into the river in the delusion that she had been untrue to him; but the others which come to mind are, as you will note, of different character. The second was a man, a school teacher, who had spent some years in America and presumably had learned to drink as many in our country drink. The third was a fisherman of Hong Kong, coming, you will see, in close contact with the foreign institutions of that island and no doubt drinking foreign liquors. The fourth was a civil official who, as we learned, had for sometime been drinking "blandy," that is, brandy. The fifth was the captain of a freight boat running between Hong Kong and Canton. It will be noticed that of the five cases which I can bring to mind, four had been in close contact with foreigners or, at least, used their alcoholic beverages. This is not a large number of cases from which to draw any general conclusion, but they are of some value in showing that the Chinese are more liable to develop an alcoholic psychosis by adopting the drink habit and drink material of foreigners. And, now that the use of opium is becoming so restricted by popular opinion and government regulation, it is greatly to be feared that we shall see more cases of insanity from the use of alcohol unless the government can prevent or restrict the entry of foreign liquors into the land. We have often observed in cases of manic depressive insanity brought to us the second or third time or more, (a

relapse having occurred) how often the relapse has been brought on by drinking wine, so that we always in discharging a recovered case warn the patient and the friends against taking even a taste of wine; because we have noticed how sensitive the people are to its effects who have a tendency toward manic depressive insanity.

It is hard now not to stop for a moment the scientific side of this question and to dwell upon the duty and privilege of our country in taking some step as a friend of China, and as a friend in whom China has confidence in this important stage of her history—some step to warn and help that land, to prevent the deadly curse to civilization and progress being imported from our own and other outside shores, to the incalculable detriment of her people.

THE USE OF OPIUM.

It would seem strange that in a land where opium had been used to such excess and by so many of the people, and where in the last years morphine has been deceitfully introduced and scandalously and widely sold as a cure for the opium habit—it seems strange that we have seen nothing which we can say surely is a psychosis following the use of those drugs. We receive many cases who are not only insane but who are opium smokers as well, it is true, but they are cases of insanity which have been given opium to keep them quiet, or who have developed some form of insanity other than that of the drug. But I know there is a dementia following the use of opium, although such cases have never been brought to us as far as we have recognized them. When working out the new vocabulary of terms used in psychiatry with my Chinese teacher, I described dementia to him, looking to him to select a proper Chinese term for the same. He at once said: "We know that; that is the condition of opium sots," and he added that they would mutter to themselves.

PARESIS.

Syphilis is very prevalent. Until within a very few years, however, we saw few cases of paresis. We have often asked ourselves why this could be. One probability and two possibilities will account for the fact. The probability is that we did not

recognize the earlier cases. The two possibilities are the following: The dementia develops slowly and is not often attended with great violence; moreover, it is usually seen in middle-aged persons who already have families. Filial love, very strong among the Chinese, would dictate that the parents should be shown every honor and everything possible be done for them. The children would be reluctant to allow the parents to be taken away from the home and where they could not themselves attend upon them. If this be the reason that kept these paretic cases from coming to the hospital in years past, there must have come a change of sentiment; and we may hope it has come because of a growing confidence in the good care given at the hospital. Again, it has been held by some psychiatrists that the etiological factors in paresis are syphilis, plus something—alcohol, vocation, or something. If it should turn out to be alcohol it would be easy to explain a rather sudden appearance of paresis by the same fact that explains the sudden appearance, though in greatly limited numbers, of the alcoholic psychoses, namely, by the recent introduction of foreign liquors or of foreign habits in taking liquors. However it came about that there were for years so very few cases; there is now every year a considerable number. I have here no statistics with me, but one can get at the proportion approximately in another way. I remember that for the two last successive years there were, each year, fourteen or fifteen deaths from paresis. It would be safe to say that they had been in the hospital not longer than a year; that is, they had been brought the year before. Something like 270 of all kinds were received at the hospital the year before. If 15 died of paresis the year following that year when 270 came in, we would get the proportion of 270 to 15 or 5½%. This can be taken only as approximate. Among our patients, as among those of our home lands, the men paretics outnumber the women considerably.

OTHER CONTRIBUTORY CAUSES.

Among the conditions that no doubt contribute to the prevalence of insanity, one should speak of the awful poverty; the distress following flood, pestilence and famine at certain times, and in the case of a large number at all times the difficulty of getting enough

food to fill the mouths of the family—these conditions surely have a part in producing mental disease.

Tuberculosis is exceedingly prevalent. The habit of expectorating anywhere and everywhere, of living crowded together in houses with often no windows and only a door—largely for fear of thieves or robbers—of closing this one opening tightly at night, of enclosing the bed in a mosquito netting of quite close material allowing little change of air and, finally, of covering up the head with bedclothes—could any means be found better adapted to the extension of the disease? And yet this is a prevalent way of living.

The *Ascaris Lumbricoides* infests the digestive tract of a large number of the people. This can be understood when one remembers the mode of fertilizing the vegetables. The manure is not dug into the ground; urine and a solution of the human excrement collected by the bucket system from the houses is sprinkled over the whole plant by the use of a watering can. Finally, certain of these vegetables are eaten in a raw state. We make a routine habit of giving *santonine* at first to every patient who enters the hospital. I remember one case, that of a little girl of twelve, who came in in a depression which disappeared within two weeks entirely after a course of *santonine*. One would think the number of round worms which this kind host had been sheltering and feeding might have produced some trouble in her economy.

Malaria is exceedingly prevalent in our part of the country both in its acute and chronic forms. Some physicians in general practise have met with mental diseases which they have thought to be caused by malaria, and have seen improvement and even complete relief in some cases following the use of quinine. These cases have not found their way to our hospital so far as we have recognized them. But it would not be strange if exhaustive psychoses should follow in the wake of severe and long standing malarial fevers.

Leprosy is common. A great colony of lepers is quartered outside the East Gate of the city. One often sees them going through the streets of Canton, or in little boats on the river begging rice or cash in order to keep soul and body together. If time allowed, I would tell how much is being done now for these

people by the missionaries and, latest of all, by the new government to make their lot one of far more comfort than formerly. But I have been surprised to find so little insanity among them. During the eleven years I have been associated in the work for insane there, I do not remember more than two cases which were lepers; one case, a man, after being in the hospital several times in post-epileptic delirium and recovering, came in at last with well developed leprosy. The other, a woman, developed it while in the hospital. Both recovered from the mental disease and were removed to the Leper Colony.

One might think that the habit of foot binding, formerly so prevalent among the genteel women, might be a cause, directly or remotely, of mental trouble. But there is nothing to corroborate this. We have had many bound-footed women in the hospital, but many of them have also recovered, and we have no reason to believe any larger proportion of such women become insane than of others who have not had bound feet. The foot-binding was begun when the girl was six years old, and it was a painful operation indeed, and handicapped her very much during all her life. Happily now the custom is one of the past. To be sure, reforms begin at certain points and only in time invade the more remote places, so it may be that in the more inland parts of the country the custom may not have altogether been given up, but it will not last much longer in any case. And many women have unbound their bound feet, and although the feet never quite recover their original form, they become very useful members and enable the owners to walk around, which had been done with great difficulty before.

Hysteria is found among the Chinese, but by far not to the same extent as in the home lands. One might think that the custom of pampering the boy children, which was spoken of before, might favor the development of hysteria in them, but such is surely very uncommon. The only marked case I myself have met was that of a young woman, very bright and pretty, who had studied Western medicine. She, however, was not insane. Occasionally we see patients in our hospital whose symptoms seem to show some tinging of hysteria, but it is not often marked.

OTHER MENTAL TROUBLES.

Cases of imperative acts are sometimes met with. I know of one woman who can never put on a garment that has not been washed six times. She is distressed in her slavery to this idea, but cannot free herself from it.

We often see cases on the borderland of the manic phase of manic depressive insanity, which one does not meet with in our own lands. I refer to those of women who go into fits of extreme anger. The Chinese are not a demonstrative people. One who shows anger is not respected. Men seem to control themselves better than women in this one matter. I have observed two women of the working class quarreling, standing each at the door of her own house and yelling to each other at the tops of their voices for two hours without ceasing. I once timed such an outpouring of wrath, and by my watch it lasted just that length of time. I have known such paroxysms of unbridled anger to result in blindness, presumably by rupture of a blood vessel in the retina.

I have been asked about Beri Beri, as to whether there is a psychosis accompanying the physical symptoms; anything like Korsakoff, since it is a polyneuritis. I remember one case coming to us with Beri Beri. He had been a drinking man. I cannot describe the psychosis for I have forgotten it, but I remember I was not sure at first whether it was Beri Beri or Korsakoff. I remember, however, that he recovered fully mentally, and before his leg muscles had regained their tone sufficiently to allow him to walk. Beri Beri has been very common in our region, and I have seen many cases in the incipient stage at our dispensary (for the general public), but I have never witnessed a psychosis in any of these. Those cases which have developed in patients in the hospital have, of course, developed after one psychosis or another was already established. Of all the cases of Beri Beri among the soldiers and among the students at the many schools, we have never had any brought to us as insane; so I think it would be safe to say there is no psychosis which plays an essential part in the manifestations.

We see few cases of paranoia. One case comes to mind, a man of perhaps 50 years, who, many years ago lost a boy by death. It was a very severe blow to him and he persisted then, as he

does to this day, that the son was not dead when his family and friends carried him away to bury him. After the funeral for sometime he used to go every day, take out the body from the grave and try to teach it to walk. He gave that up in time, convinced, I suppose, that the boy by that time was beyond hope, but he still holds to the delusion that he was not dead when carried away, and he still bitterly blames those who persisted in the burial. He is a very intelligent man, who reads the newspaper every day and is ready to do a piece of work given to him, pleased to have you greet him when making rounds, and who for years after the boy died and before he was brought to the hospital, attended to his business affairs.

Traumatic psychoses there may be, but very seldom are they brought to us. I can only account for this on the ground of the few falls that Chinese have. Their houses are usually one, or not more than two stories high, and workmen seldom wear shoes. Their bare feet enable them to climb about with little danger of falling.

In this paper I have intimated that changes are taking place in the social conditions of China. These changes are very real. I believe that within a few years this whole chapter which I have read tonight shall have to be rewritten.

STATISTICAL STUDIES OF THE INSANE.*

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Comparatively few administrative bodies charged solely and exclusively with the supervision and management of institutions for the insane are to be found in this country. In twenty-six states the insane are under the jurisdiction of boards which also have charge of the charitable institutions, and in some instances of the prisons and reformatories as well. Fifteen states have no central administrative control over the insane whatever, namely, Alabama, Arkansas, Delaware, Florida, Georgia, Idaho, Maine, Mississippi, Nevada, New Mexico, North Dakota, Oregon, South Carolina, Tennessee and Texas. In Massachusetts the feeble-minded, epileptics, inebriates and drug habitues are under the supervision of the State Board of Insanity. In New Hampshire the State Board of Health is held responsible, in addition to its other duties, for the care of the insane. In Utah the feeble-minded and epileptics are under the supervision of the Board of Insanity. In Vermont the idiots and feeble-minded come under the jurisdiction of the State Board of Supervisors of the Insane. In Maryland the State Lunacy Commission, in Illinois a board of administration, and in New York the State Hospital Commission are charged with the duty of caring for the insane.

As a result of the various forms of supervisions in the different parts of the country, there are almost as many methods of administration. There is a corresponding lack of uniformity in policy from a medical point of view. In no way can this be better illustrated than by the annual reports of the various institutions and the accompanying statistical tables. These reports usually show the changes in population, with the number of admissions, readmissions, transfers, discharges, deaths, etc. The statistical tables used by the New York State Hospital Commission until

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recently have included the following, which may be considered as fairly representative of those usually published:

1. General statistics of the state hospitals, showing the admissions, discharges, deaths, transfers, etc.
2. The same for the private licensed institutions.
3. The same for the institutions for the criminal insane.
4. Number of patients in institutions for the insane in the state, annual increase and ratio of patients to population.
5. Number of admissions to institutions for the insane in the state, exclusive of transfers, and rate per million of population.
6. First admissions and readmissions for the year.
7. Recovery rates and death rates for the year.
8. Nativity of first admissions and of parents of first admissions for the year.
9. Ages of first admissions classified according to nativity.
10. Comparison of ages of first admissions of different nationalities.
11. Length of time in United States before commitment of foreign-born first admissions, classified according to nativity.
12. Degree of literacy of first admissions classified according to nativity.
13. Psychoses of first admissions classified according to nativity.
14. Environment of first admissions to state hospitals classified according to nativity, as city, village or rural.
15. Family history of first admissions classified according to psychosis.
16. Use of alcohol by first admissions.
17. Psychoses of first admissions to each institution.
18. Nativity of readmissions and of parents of readmissions.
19. Ages of readmissions classified according to nativity.
20. Literacy of readmissions classified by nativity.
21. Psychoses of readmissions classified by nativity.
22. Environment, city, village or rural, of readmissions classified by nativity.
23. Deaths classified by psychoses.
24. Average age at death and average time in hospital of deaths during year.
25. Ages of patients dying in the several institutions.

26. Causes of death classified by psychoses.
27. Discharges classified by psychoses.
28. Residence by counties of first admissions for year.

While it is conceded that such tables should be printed for various reasons in the annual reports, they still leave much to be desired. An inspection of the statistics as published by state boards or commissions will show that they contain much food for thought from an administrative and financial point of view, but very little that is of value as far as advancing our knowledge of psychiatry is concerned. Full information is to be found regarding the age, sex, race, color, civil condition, environment, birthplace, residence and education of the patient, but comparatively little light is to be obtained as to the exact nature of the psychoses represented. When any effort is made in this direction, the results are usually characterized by striking irregularity of methods of classification in the various localities. Some still follow classifications in vogue twenty or thirty years ago; others have adopted various modifications of Kraepelin's ideas, while the great majority give no information whatever regarding the various forms of insanity. It was not until the twenty-first annual report published for the year ending September 30, 1909, that a modern, comprehensive classification was used by the Commission in Lunacy of the State of New York.

The recovery rate has been estimated as based on the number admitted for the year, the average daily population, the whole number treated, the number discharged and the rate per thousand or ten thousand of the admissions, etc. All of these methods are, to say the least, unreliable, if not absolutely misleading. The total number of recoveries includes those occurring in the whole population under treatment representing the accumulation of years in the form of various psychoses from which no recovery can possibly be expected, such as epileptics, seniles, imbeciles and the terminal stages of various other conditions. The recoveries from this total population have little if any real relation to the number admitted during the year. It would be highly desirable if, from a given thousand or ten thousand consecutive admissions, accurate and definite reports could be obtained showing how many are discharged improved or recovered, how many die, and what percentage become permanent residents of our chronic wards.

Only such statistics can accurately determine the real recovery rate or give us any definite idea as to the ultimate disposition of the cases admitted. In spite of the great wealth of material for study in our institutions, we have comparatively little information as to the definite percentage of the different psychoses represented in admissions or discharges. The 1911-1912 report of the New York State hospitals shows for the first time the various subdivisions of the different psychoses included in the first admissions.

The number admitted per year, as compared with each one hundred thousand of the general population of the state, is of some value in determining the insanity rate. The death rate is of comparatively little significance unless it shows the percentage of a definite number of admissions that die, rather than the deaths occurring in the total hospital population, including cases admitted during a period of twenty or thirty years. The causes of death which have some definite relation to the various psychoses represented should be shown. The nativity, environment, residence, degree of education, etc., are of little consequence unless there is some relation to the various forms of insanity in question, all of which must be considered separately. Studies of heredity are of comparatively little value, except as based on the individual psychoses instead of representing the insane population in general. The revival of interest in this subject has resulted in scientific methods, based on the Mendelian theories, which indicate the importance of collecting much more accurate statistics regarding the transmission of mental diseases than have been obtained before. Much valuable information can be obtained by making studies of the ultimate fate of the discharged patients, with particular reference to the special forms of the psychoses. It is only in this way that we can tell definitely how many cases of dementia præcox, for instance, make permanent recoveries; how many are sufficiently improved to resume their home life, although not entirely recovered; the length of time during which they are able to remain outside; how many subsequently return, etc. Such studies can only be made by competent field workers or after-care agents, and will throw a light on the ultimate outcome of these cases which can be obtained in no other way. Special statistical studies must be based on careful and accurate

methods of examination and on the elaborate case records which are now available in our institutions. Much can be accomplished if such investigations are undertaken by the administrative bodies having state supervision of the insane. With the great wealth of material available for study in our large hospitals we should have accurate statistical information as to the relation between the use of alcohol and the various forms of alcoholic insanities. Why do some alcoholics have Korsakoff's disease, while others have paranoid or hallucinatory conditions, and still others show a simple form of mental deterioration? We should have accurate information regarding the forms of alcohol used and the periods of its use.

The records of the various hospitals would be of great value in determining the lapse of time occurring between the appearance of the initial lesion of syphilis and the subsequent development of tabes, general paresis or cerebral syphilis. The accurate duration of these diseases should be determined. In these parasymphilitic disorders it would be interesting to know whether mercurial or other forms of treatment were instituted on the appearance of the initial lesion, and if so, for what length of time active treatment was continued. Accurate information should be obtained as to the etiological factors involved in the development of the different forms of dementia præcox and the relative frequency of duration of attacks of excitement and depression in cases of manic-depressive insanity, etc.

There is as yet much to be learned regarding the drug and other toxic psychoses. Valuable statistical information could be collected on the subject of the so-called symptomatic depressions. The recent works of Freud and others on the subject of hysteria and the influences of sexual traumas should be made the basis of a general statistical study along these lines. The views now held regarding paranoia and the paranoid conditions strongly indicate tabulations which will give us some accurate knowledge of these psychoses, regarding which our views have materially changed during the last few years. The constitutional disorders and inferiorities lend themselves particularly to statistical studies of various forms. The existence of eccentricities and peculiarities as well as actual intellectual defects, constituting evidences of constitutional conditions which have a very material bearing on

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the etiology of dementia præcox, paranoic and other psychoses, is entitled to very careful consideration.

A study of the statistical reports of the New York State Hospital Commission for the year ending September 30, 1912, shows that a beginning has been made in collecting statistical information which will be of greater value than that which has heretofore been at our disposal.

The number of insane in the New York state hospitals in 1912, as compared with the general population of the state, was 1 to 282, a ratio which has not changed to any material extent for some years. There is a slight difference as regards the sexes, the ratio of males being 1 to 293 and that of females 1 to 273. In 1910 the ratio for women was 1 to 269. The preponderance of females in the hospital population is due to several important factors, the principal one of which perhaps is the greater longevity of women. It is to be remembered, furthermore, that the alcoholic psychoses, which usually recover, and the cases of general paresis, which always terminate fatally, are very largely included in the male population.

It is interesting to note that only 8.3 per cent of the insane in the New York institutions are reimbursing patients. The great majority of them are supported entirely at the expense of the state.

There were 297 voluntary cases received during the year, of which 168 were first admissions and 129 were readmissions. The laws of New York provide that voluntary cases may be accepted when the mental condition of the patient is such as to enable him to recognize the necessity for treatment and make an application therefor. The large proportion of readmissions included in this number demonstrates the truth of the argument that there are many who realize fully the necessity for hospital care. Of the 297 voluntary patients 53 were subsequently committed during the year.

The average number on parole in the various hospitals during the course of the year was 905. It is customary when a patient has recovered to a sufficient extent to warrant his leaving the institution to grant him a parole for a period of time which must not exceed six months, to make sure that his improvement has

reached such a stage that he can properly adjust himself to the former surroundings.

It is worthy of note that the criminal insane at the close of the year constituted approximately 4 per cent of the population of the state hospitals.

The 22 private institutions for the insane admitted 459 patients during the year; 95 were discharged recovered, 55 much improved, and 112 improved during the same length of time. In other words, 16 per cent of the total number under treatment were discharged as benefited and 5.8 per cent as completely recovered.

The insane population of the state numbered 14,405 in 1890 and 31,624 in 1912. The increase from 1890 to 1900 was 47.7 per cent, while that of the general population of the state during the same period was 21.2 per cent. The increase from 1900 to 1910 was 37.8 per cent, while that of the general population of the state during the same period was 25.4 per cent. During the past two years the population of the state has grown more rapidly than has the hospital census.

Of the 4046 discharges during the year ending September 30, 1912, 1610 were reported as recovered, 557 as much improved, 1072 as improved, 690 as unimproved, 117 as not insane. Based on the first admissions, the percentage of recoveries was 28.04. Attention has already been called to the fallacy of this method of estimating recoveries. Based on the total number under treatment during the year, the percentage of recoveries was 4.12. This, however, includes a large number of chronic and incurable cases which have been accumulating in the hospitals for years and which interfere seriously with determining the actual percentage of cases in which a recovery can be hoped for and which should be based only on the final disposition of the first admissions. Including those improved and much improved, the number discharged during the year as having been materially benefited by treatment amounts to 3239. The recoveries per 100 admissions were 21.9 for the year.

An analysis of these cases is of interest.

Of the alcoholic cases, 359 were discharged recovered, 125 as improved or much improved, and 26 as unimproved during the year, a total of 510 discharges, as compared with a total of 684 admissions during the same time.

Two senile cases were discharged recovered, 15 much improved, and 33 improved during the year; 626 senile cases were admitted.

Thirty-nine cases of drug psychoses were admitted during the year; 29 were discharged recovered and 6 as improved.

One hundred and thirty-three diagnosed as infective exhaustive conditions were admitted during the year; 56 cases were discharged as recovered and 11 as improved or much improved.

One hundred and fifty cases of involution melancholia were admitted during the year; 50 cases were discharged as recovered, 32 as improved and 13 unimproved.

Twelve hundred and twenty-six cases of dementia præcox were admitted during the year; 10 cases were discharged as recovered; 103 as much improved; 284 as improved and 255 as unimproved.

Two hundred and forty-seven cases of paranoic conditions were admitted during the year; 11 were discharged recovered, 16 much improved, 68 as improved and 50 as unimproved.

Eleven hundred and sixty-seven cases of manic-depressive insanity were admitted during the year. As compared with this, 627 cases were discharged recovered, a percentage of 53.9; 91 cases as much improved, 41 as improved and 53 as unimproved.

Ninety-six cases of psychoneuroses were admitted; 42 cases were discharged as recovered, 20 much improved and 17 improved, 11 unimproved.

It must be remembered that the number discharged bears little definite relation to the number of the same psychoses admitted and they are cited together merely for purposes of comparison.

Of the 7283 admitted during the year, 78.8 per cent were first admissions and 21.2 per cent readmissions. Of the first admissions 3008, 52.39 per cent, were of native birth and 2699, or 47 per cent, were of foreign birth, less than 1 per cent being unascertained; 1270, or 22.12 per cent, were of native parentage; 4214, or 73.39 per cent were of foreign or mixed, and 4 per cent of unknown parentage. Of the 2699 patients of foreign birth, 23.1 per cent were born in Ireland, 15.3 per cent in Germany 13.6 in Russia, 9.8 per cent in Italy, 8.4 per cent in Austria, 5.6 per cent in England, 4.4 per cent in Hungary, 3.7 per cent in Canada, 2.1 per cent in Poland, other countries were represented by less than 2 per cent in each case. The rate of insanity of the native popula-

tion was 47 per one hundred thousand in 1912 and the foreign population 97 per hundred thousand. The rate of admissions per 100,000 of population as shown by the census of 1910 was 108 for Austro-Hungary, 101 for England and Wales, 169 for Ireland, 81 for Canada, 56 for Italy, 104 for Scandinavian countries, 116 for Scotland, 85 for France, 94 for Germany, 76 for Russia and Poland.

Of the 7283 patients admitted during the year, 54.3 per cent were citizens by birth, 15.9 per cent were naturalized and 16.2 per cent were aliens, 13.6 per cent being unascertained. Of the total number of patients of foreign birth admitted during the year over 17 per cent had resided in this country less than five years, 12.5 per cent from six to nine years, and 42.6 per cent for twenty years or more.

Of the first admissions during the year, less than 1 per cent were under 15 years of age, 5.5 per cent were from 15 to 19, 10.8 per cent from 20 to 24, 22.7 per cent from 25 to 34, 21.9 per cent from 35 to 44, 15.6 per cent from 45 to 54, 10.4 per cent from 55 to 64, and 12.4 per cent 65 years of age or over.

Of the 5742 first admissions in the various hospitals during the year, 596, or 10.4 per cent, were senile cases; 719, or 12.5 per cent, general paresis; 294, or 5.1 per cent brain tumor and various nervous diseases; 567, or 9.9 per cent, alcoholic psychoses; 23, or .4 per cent, drug and other toxic psychoses; 125 or 2.2 per cent, infective exhaustive or auto-toxic conditions; 14, or .2 per cent, symptomatic depressions; 18, or .3 per cent, depressive hallucinosis; 119, or 2 per cent, involution melancholia; 185, or 3.2 per cent, depressions undifferentiated; 919, or 16 per cent, dementia præcox; 190, or 3.3 per cent, paranoic conditions; 658, or 11.5 per cent, manic-depressive psychosis; 179, or 3.1 per cent, epileptic insanity; 74, or 1.2 per cent, psychoneuroses; 186, or 3.2 per cent, constitutional inferiorities; 70, or 1.2 per cent, imbecility with insanity; 262, or 4.6 per cent, were unclassified; 86, or 1.5 per cent, were not insane.

Of the 596 cases of senile psychoses, 297, or 49.8 per cent were diagnosed as simple senile deterioration; 64, or 10.7 per cent, paranoid forms; 57, or 9.6 per cent, delirious and confused states; 28, or 4.7 per cent, depressed and agitated states; and 11, or 1.8 per cent, were of the presbyophrenic type.

Of the 719 cases of general paresis, 450, or 62.5 per cent, were of the cerebral, and 127, or 17.7 per cent, of the tabetic type. There were 45 cases of cerebral syphilis, constituting .8 per cent of the total first admissions, and 166 cases of cerebral arteriosclerosis, a percentage of 2.9.

Of the 567 alcoholic cases, 43, or 7.6 per cent, were of alcoholic deterioration; 108, or 19 per cent, Korsakoff's disease; 199, or 35 per cent, acute hallucinoses; 12, or 2.1 per cent, chronic hallucinatory conditions; and 74, or 13 per cent, paranoid states. There were four cases of psychoses resulting from illuminating gas poisoning.

Of the 125 cases of infective exhaustive insanity, 23, or 18.4 per cent, were cases of infective delirium; 7 of the exhaustive type of psychosis, and 17, or 13.6 per cent, of delirium, with heart disease.

Of the autotoxic disorders there were two cases of thyrogenous insanity and 22 of uremic and diabetic disorders.

Of the 929 cases of dementia præcox, 441, or 47.5 per cent, were of the paranoid form; 65, or 7 per cent, of the catatonic, and 167, or 17.9 per cent, of the hebephrenic; 75, or 8 per cent, were of the simple form; 210 cases, or 3.7 per cent of the total first admissions, were classified as allied to dementia præcox.

Of the 658 cases of manic-depressive insanity, 324, or 49 per cent were of the manic type; 168, or 25.5 per cent, of the depressive; 36, or 5.5 per cent, of the circular form, and 70, or 10.6 per cent, of mixed conditions; 196 cases, or 3.4 per cent of the total first admissions, were diagnosed as allied to manic-depressive insanity.

Of the 74 cases included under the heading of psychoneuroses, 26 were of the hysterical, 16 of the psychasthenic, and 27 of the neurasthenic type.

Of the 186 cases of constitutional conditions, 20, or 10.7 per cent, were psychopathic states, and 92, or 49 per cent, were of constitutional inferiorities.

There were 512 deaths during the year in the cases diagnosed as senile psychoses. Of these, 11 were due to pulmonary tuberculosis, 14 to carcinomata, 17 to apoplexy, 125 to cardiac diseases, 108 to arterial diseases, 78 to broncho-pneumonia, 41 to lobar pneumonia, 17 to enteritis, 17 to nephritis.

Six hundred and eleven cases of general paresis died during the year. Of these, 9 were due to pulmonary tuberculosis, 9 to cardiac conditions, 2 to arterial disease, 35 to broncho-pneumonia, 23 to lobar pneumonia, 3 to nephritis, and 491 were ascribed merely to general paralysis of the insane.

Four hundred and sixty-three cases of dementia præcox died during the year; 144, or 31 per cent, were due to tuberculosis; 13 to apoplexy, and 16 to exhaustion, 73 to cardiac conditions, 23 to diseases of the arteries, 26 to broncho-pneumonia, 39 to pneumonia, 21 to nephritis.

Ninety-three cases of involution melancholia died during the year. Death was due in 19 cases, or 20 per cent, to pulmonary tuberculosis; in 16 to cardiac conditions, in 4 to arterial diseases, in 15 to pneumonia, in 8 to enteritis, and in 10 to nephritis.

One hundred and twenty-four cases of epilepsy terminated fatally during the year; 11 were due to tuberculosis, and 26 to pneumonia.

One hundred and sixty-three cases of manic-depressive insanity died during the year. Thirty of these deaths were due to pulmonary tuberculosis, 28 to exhaustion, 32 to cardiac conditions, 9 to arterial diseases, and 22 to pneumonia.

Of the first admissions, 596 were senile cases. Of these 298 came from first class cities having a population of over 175,000, 40 from second class cities with a population of 50,000 to 75,000, 24 from third class cities with a population of 20,000 to 50,000, one from third class cities under 10,000, and 186 from villages and rural districts.

Of the 719 cases of general paresis admitted during the year, 531, or 73.9 per cent, were from the first class cities, 35 from second class cities, 23 from third class cities of 20,000 to 50,000, 28 from third class cities under 20,000, and 86 from villages and rural districts.

Of the 567 cases of alcoholic psychoses admitted during the year, 372, or 65.6 per cent, were from first class cities, 35 from second class cities, 30 from third class cities of 20,000 to 50,000, one from third class cities under 10,000, and 83 from villages and rural districts.

Of 119 cases of involution melancholia, 49, or 41 per cent, were from first class cities, 6 from second class cities, 17 from third

class cities of 20,000 to 50,000, 7 from third class cities of 10,000 to 20,000, one from third class cities under 10,000, and 38, or 32 per cent, from villages and rural communities.

Of the 919 cases of dementia præcox, 655, or 71 per cent, were from first class cities, 63 from second class cities, 31 from third class cities of 20,000 to 50,000, 35 from third class cities of 10,000 to 20,000, 2 from third class cities under 10,000, and 113 from villages and rural districts.

Of the 658 cases of manic-depressive insanity, 443, or 67 per cent, were from first class cities, 45 were from second class cities, 26 from third class cities, 18 from third class cities of 10,000 to 20,000, 2 from third class cities under 10,000, and 113, or 18 per cent, from villages and rural communities.

Of the 4260 cases where definite information could be obtained, 1099 showed a definite history of insanity in the family, 647 a history of nervous diseases, alcoholism, etc., and 2514 no evidence of such heredity. In other words, 41 per cent of ascertainable cases had an unfavorable family history.

Of the cases of dementia præcox, there was a history of insanity in 48.2 per cent; of involution melancholia, in 55.2 per cent; of psychoneuroses, in 51.6 per cent; of senile psychoses, in 38 per cent; of general paresis, in 28 per cent; of paranoic conditions, in 45 per cent; and of imbecility, in 75 per cent.

The excessive use of alcohol appears in 25.32 per cent of the ascertainable cases in 1912. It is given as an etiological factor in 869, or 15.1 per cent, of the admissions.

An effort was made during the year to ascertain the constitutional makeup of the individuals represented by the various psychoses. These were reported as normal, inferior or defective. The term "inferior" was applied to persons who, while not actually defective, have not kept abreast of their opportunities, who, with educational opportunities, have not acquired an education, or who have not prospered by reason of poor judgment, lack of self-control and initiative. These investigations show that of the alcoholic cases, 10.7 per cent were inferior; of the dementia præcox group, 31.3 per cent; allied to dementia præcox, 27.4 per cent; manic-depressive, 12.8 per cent; epileptic psychoses, 31.1 per cent; other constitutional inferiorities, 84.6 per cent.

Of 627 cases of manic-depressive insanity, 235 entered hos-

pitals within 15 days after the onset of the psychoses, 54 from 15 to 30 days, 100 from 30 days to two months. Three and three-tenths per cent recovered within one month, 38.8 per cent after one to three month's residence, 15.6 per cent 4 to 6 month's residence, 12.6 per cent 6 to 7 months, 8.6 per cent 8 to 9 months, 7 per cent 10 to 13 months, 4.5 per cent 14 to 17 months, 4.8 per cent 18 to 24 months, 4.8 per cent were in the hospital more than 24 months; 57.7 per cent of the whole number of cases recovered after a hospital residence of less than 6 months.

A further excursion into the subject of the statistical aspects of insanity would, I think, prove not only unprofitable, but wearisome. It will, however, be conceded that valuable information can be obtained in the institutions under our charge if proper statistical studies are instituted. In conclusion, I would strongly urge upon the American Medical-Psychological Association, as the only national organization interested exclusively in the study of insanity, the advisability of undertaking the preparation of a uniform method of statistical study for adoption by the various administrative boards connected with the different states and provinces.

THE GENETIC CONCEPT IN PSYCHIATRY.*

By WILLIAM A. WHITE,

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I will begin by telling you briefly the story of a case communicated to me by Dr. Gregory. The patient was a young girl who lived in the country not far from New York City. Financial straits of the family made it incumbent upon her to leave her home in the country and betake herself to New York to earn a livelihood. Upon the eve of her departure her parents, solicitous for her safety, warned her against the lures of the great city. They told her to be careful and not to be deceived by suave strangers who might approach her, and by no means ever to permit herself to yield to an invitation to take any alcohol, and they told her about knock-out drops; if she needed information to ask an official, a policeman—never a stranger. This was the time, too, when the papers were filled with accounts of the exposures in the white slave traffic, and she had read of this.

Shortly after her arrival in New York she was able to secure a position at a salary of \$15 per week, got a boarding place, and everything went well. After a while, however, her employer came to her and told her that matters had not been going well with him in a business way and that therefore he would be forced to reduce her salary to \$8 per week. This necessitated a readjustment on her part, and the first effort she made was to see if she could not get another position that would pay her as well. This, however, she was unable to do and finally had to realize that she must go on at the reduced compensation. This required that she should cut down expenses and live cheaper. To that end she secured a room in a cheaper German boarding house on the East Side.

Hardly had she settled in her new quarters than one evening at dinner she was begged to have a glass of beer; the boarders being German, beer was commonly served at the table. She refused and resisted, but finally yielded and drank a little beer.

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

While sitting at the table she overheard two of the men opposite talking, and one said to the other, "I think it can be done for \$50." This alarmed her considerably, and after leaving the table she went into her room and shut the door and went to bed. She heard constantly, however, footsteps about the house, and she felt convinced that something wrong was going on; that evil designs were in the minds of some of the boarders, and that they were preparing to invade her in her room. About this time, too, the little beer that she had drank disagreed with her, made her stomach feel bad, and she was afraid that it had been doped. She became more and more frightened, and finally arose, put on her things, hastily left the house and sought a physician. He made some examination of her and looked at her tongue, and then, according to her story, said that he thought she had been poisoned. This was the last stroke. She rushed from the physician's office, shrieking into the street, and was shortly taken up by a policeman and sent to the Bellevue Pavilion. Here she was in a wild state of excitement, absolutely inaccessible for two or three days, and then finding that her environment was a friendly one, that they were trying to do things for her and not to injure her, she gradually calmed down, and at the end of approximately three days she quite recovered from the episode, had full insight, and could leave the hospital.

We are dealing here quite evidently with an hysterical episode of very acute onset and rapid subsidence, but how are we to explain, to understand, the symptoms? I have cited the case because it would seem that here we have quite a simple illustration of the general concept that I wish to give you in this paper.

In order to understand the mechanisms here involved we must realize first that this girl had had certain warnings from her parents on starting for New York. These warnings had been received, understood at the time, and then practically at least, laid aside and forgotten after she arrived in the city and adjusted herself to the new conditions, secured employment and settled down in the new relations. Now a difficulty arises; she has to make a complete readjustment which involves a considerable sacrifice of her comfort, and this is a difficult thing to do. In her attempt to deal efficiently with reality she is not successful altogether. Now the interesting thing about her lack of success in

dealing with the problem of her new adjustment shows itself by a psychosis that is easily seen to be nothing more than a realization, a coming to life, as it were, of all the possibilities suggested by her parents warnings. How can we understand this reanimation and reactivating of things which have gone before and been left behind?

In order to explain this psychosis it is necessary to enter the realm of hypothesis. It will be seen that the psychosis can be understood if we first postulate some form of psycho-physical energy which has the capacity under certain circumstances of flowing back, as it were, and re-animating old experiences. This is the theory of the introversion of the libido, or if the term libido is not liked, of the psycho-physical energy, or whatever name you wish to give. An elaboration of the theory is to the effect that the individual is constructive, creative, mentally healthy, so long as this energy is flowing outward in interest upon the external world of reality; that when it flows backward within the individual himself, then disorder of mind is the result. The occasion for a flowing backward of the energy or an introversion, as it is called, is some difficulty met with in effectively dealing with reality; a difficulty arises and adjustment is impossible; the flow of the energy outward is impeded; it is dammed up, and it flows backward. In this way old channels are reanimated as in the case I have cited.

The application of the theory of a psycho-physical energy, the dealing with the mind in terms of energy, enable us to understand the case cited I think very clearly. The following out of this theory, however, has certain wider applications, which are the particular ones to which I desire to call your attention.

In the first place, if we bear in mind that man is what he is at any particular moment only because of all that has gone before; that his mental life is one of constant growth and development, one of constant accretion, of adding to from below upward, then we can understand that a regressive libido, a libido flowing backwards, will reanimate successively lower levels and bring into the foreground mental qualities that are more and more childlike in proportion to the depth of the introversion. My paper is essentially a theoretical one, and for that reason and also because of temporal limitations I cannot enter into elaborate illustrations

to show this. However, you are all familiar with the childlike qualities that are exhibited in many of the psychoses. The hysteric, for example, almost invariably impresses you as childish, the playfulness of the manic case is proverbially childish and many of the traits of the *præcox* are also. We see here, therefore, the importance of child psychology to an understanding of the psychoses; the importance of the genetic principle as applied to the interpretation of the childlike characteristics that we see so frequently in mental disorder.

Still a further implication follows: If man at any particular time is an end product of all that has gone before, all that has gone before implies very much more than his own individual life. If it has been possible for you and me to-day to attain a certain height of intellectual development it is only because we have been able to stand upon the shoulders of the generations that have preceded us. The development of the mind, like the development of the body, has had its history through the ages, and the mind like the body carries along within it evidences of its history. We could not possibly understand the appendix or the *ligamentum nuchæ*, or a thousand other specific things in the anatomy of the human body, if we were not acquainted with comparative anatomy and knew their individual histories. And so there are things in the human mind that are inexplicable unless we know their histories.

Whereas the general statement that the mind has had a history just as the body has may be accepted, it is another thing and a more difficult thing, to understand how there may be vestiges of that history preserved in the mind showing the sources of present-day structures. We think of the mind as something intangible, of something incapable of being formed and preserved from generation to generation. The comparison I have given I trust will help to make this possibility clearer. However, I feel that it is not yet clear, and I would say in addition that I do not mean by any manner of means that ideas, definite concepts, actual memories, if you will, are handed on from generation to generation; that I do not mean, but I do mean that such a structure of mind may exist in a given individual or under given conditions of disease that corresponds to the structure at a lower cultural level in the history of the race, and that when this correspondence

occurs then, with certain variations of content, we get the same general results in the way in which the individual thinks and feels and comes into contact with the world of reality and of experiences.

The introverted libido, therefore, will not only reanimate progressively lower levels in the history of the individual, but it can also reanimate progressively lower levels in the history of the race. So that a given mental disease may reduce the individual first to a condition resembling his childhood and then to a condition of mind resembling a lower cultural level in the history of the race. This is the theory upon which we are attempting to explain certain so-called archaic modes of reaction which are found so frequently in cases of *dementia præcox*, although they may be found not only in other conditions, but in people who are practically free from mental disease, but in which these types of reaction crop out in phantasy formation, more especially in dreams.

A simple illustration at this point may serve to make what I mean somewhat more clear. An old gentleman dreamt that he was two logs of wood, separated in different places and that he could not get together. The meaning of the dream was quite clear. He felt himself split into two opposite tendencies. He had always desired in his life to go one way, but circumstances had forced him another, and so there was a continuous conflict throughout his life between what he desired on the one hand and what he was forced to do on the other. The principal question is, Why should this man represent himself in his dream as wood. His associations to wood were three: namely, fire, food, and ashes. If we will go back to the history of primitive man and realize the tremendous importance that wood had for him, particularly as being the carrier and container, in accordance with his way of thinking, of fire which was of such vast importance and so difficult to create, we begin to see that our dreamer is giving an importance to wood that is commensurate with the importance which primitive man gives it and in somewhat the same way; because, does not the wood contain fire, and is not fire life? We have plenty of examples of the use of fire as meaning life. We speak of the flame of life, the heat of passion, and have many other similar expressions, and so wood contains the fire or the life just as the mother contains the child and the flame and the fire comes

forth from the wood and the child comes forth from the mother. Primitive man also believed that the food that was cooked over the fire absorbed the qualities of the fire, and so if the fire was a god then the food absorbed the divine qualities. And finally ashes mean death. The dreamer was very much afraid of death. He realized that he never could attain to union with himself in this life, and so ashes would signify the only way in which he could obtain this union, namely, in death. The ashes are the residue of the wood after burning and so the woman is looked upon not only as the source of life, but the source of death. She not only creates a new life, but passes her own life on into the new, and therefore dies in giving birth.

All of these symbolisms group about the symbolism of wood as representing the individual. You will see now what I mean: wood, fire, food, ashes, were all naturally within the experience of the individual, but he uses this material—he uses these experiences, in an archaic way; he gives them turns of meaning that correspond to the meanings given by primitive man; he looks upon them from the standpoint of a lower cultural level. The split in his life had come very early; it had gone very deep; it involved his most profound thinking and feeling, and so it went way back to those early types of reaction which I have designated as archaic.

In the few minutes at my disposal I have only been able to give you a mere outline of what I mean by the genetic concept. You will see how pregnant it is of possibilities, and at least I hope you may appreciate that this is a concept that must be reckoned with from now on until it has been properly evaluated and taken its place definitely as an interpretative formula for psychiatry.

PSYCHOLOGY AND THE MEDICAL SCHOOL.*

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That psychology should bear the same relation to psychopathology and psychiatry that physiology does to general medicine is a truism that is almost a platitude. It is perhaps less obvious, though to my mind not less true, that psychology should rank among the fundamental sciences, on a par with anatomy and physiology, if not with chemistry, physics and biology, necessary for *all* students of medicine, not merely for those who intend to take up certain specialties. Until recent times, however, little effort has been made to introduce this study into the medical curriculum. It will be introduced if the demand is strong enough, and it is the object of this paper to interest this society and urge it to take some action in the matter.

The need of psychological instruction is not an altogether new subject. In December, 1911, it was considered at a symposium at the combined meetings of the American Psychological Association and the Southern Society of Philosophy and Psychology, in which Drs. Meyer, Franz, Prince and others took part. Since then the subject has been brought up at meetings of other societies. But I believe it has not been discussed, at least in recent years, by this association, which, on account of its name, its membership and its size, should be able to exert a strong influence.

Certain specialists need psychology. For example, it is obvious that physiological psychology lies at the basis of neurology. And it is probably that field that Lancaster² had in mind when, in outlining recently an improved course in ophthalmology, he included 15 hours out of a 300-hour course to be devoted to "psychological problems." In otology, rhinology and laryngology, too, there are a few problems that belong in this field. Psychiatry's need of psychology has already been noted.

Besides this, there is a rapidly growing demand for more thorough investigation of the mental states and processes, not only in such groups as the neurasthenic and the very sick, who

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come under the observation of the general practitioner, and in such groups as the obviously feeble-minded, the epileptic, and the hysterical, who usually come under the observation of the neurologist or the psychiatrist, but also in such groups as the deaf mute, the slightly backward school child, the defective delinquent, the criminal, the pauper and the prostitute.

Most of these latter groups are defectives. For the best ways of dealing with them the community naturally turns to the physician, though, if there were a large body of trained psychologists, it might turn to them. The school and the police physicians, who usually see these cases in the first instance, are general practitioners, and it would be helpful if they had the requisite grounding in psychology to deal with them. Franz¹ and White² have pointed out the need of such grounding.

But it may be urged that the general practitioner sees after all only a comparatively small number of such cases; that they can be referred to specialists who are sufficiently grounded in psychology, and that the teaching of psychology might well be limited to those who wish to fit themselves for these specialties.

To that it can be answered that since in almost every medical school psychiatry is a required course, its foundation science, psychology, should be taught as a prerequisite. But, even apart from that, not only the specialist but *every* practitioner of medicine and surgery needs psychology.

Lyon,³ reporting last February for the Committee on Pedagogy at a meeting of the Association of American Medical Colleges, states one of the aims of general medicine to be "to give the student as much knowledge as possible of human beings into whose life he must enter in a much broader, more sympathetic relation than that of engineer to machine." Franz¹ calls attention to the fact that the general physician depends on the patient for information about his illness, and that the patient's sensations and feelings have weight in the diagnosis. White² refers to the fact that there is a mental side to every illness, even to a sore finger, and that the patient is a thinking, feeling being. They might have added that wherever the patient's co-operation in the examination and in following out directions for treatment is concerned, there are psychological factors of the utmost importance—factors which are present to a greater or less degree

in all cases except those in infancy and childhood and of unconsciousness and stupor. Moreover the bodily and mental effects of such emotional states as dread (of operation, death, going to a hospital, certain illnesses, etc.), courage, hope, despair are neither negligible nor infrequent; neither are the effects of prejudices, errors, superstitions, or ignorance on the general attitude of the patient toward his illness, his treatment and his physician. These are psychic factors that every physician and surgeon is likely to meet and meet frequently.

Furthermore, it is the psychic factor in all illness and in all therapy that has given such vogue to many of the recent psychotherapeutic movements, whether scientific, pseudo-scientific, or fraudulent. It is the psychic factor that makes the success of the quack, the charlatan and the nostrum vendor. A knowledge of psychology would help each physician and surgeon in the use of that which is true and in the fight against that which is false in all these doctrines and practices. The recognition of the importance of these psychic factors is growing, and some grounding in them must be given, if the forementioned aim of medical teaching is to be fulfilled.

II.

To find out how extensively psychology is being taught in the medical schools of this country, inquiries were made of all the medical schools classified by the Council on Medical Education of the American Medical Association as A + (acceptable), A (colleges lacking in certain respects, but otherwise acceptable), and B (colleges needing general improvements to be made acceptable). No inquiries were made of the class C schools (colleges requiring a complete reorganization to make them acceptable). To the deans of the 85 schools of these three classes the following questions were sent, together with a request for the catalogue, announcement or bulletin of the school:

1. Is psychology required for admission to your school?
2. Is psychology taught in your school?
3. If so, is it a required or elective study?
4. If elective, roughly what proportion of students elect it?
5. In what year or years is it taught?

6. How many hours are given to it?
7. Is the instruction by (a) lecture, (b) text-book, (c) laboratory, or by what combination of them?
8. What text-books are used?
9. Has the instructor in psychology a knowledge of psychiatry gained from clinical experience?

From these questions it will be seen that no effort was made to determine the type of psychology that is taught, except as this might be shown by the text-books.

Replies were received from 58, and bulletins from only 24 of these. Most of the schools are associated with or are integral parts of some university, many of them state universities; most require at least the equivalent of two academic years for admission to the medical school. A few give only the first two years of the medical course, omitting clinical teaching.

The following data are based on the 58 replies received. The extent of psychological teaching is shown in the table:

PSYCHOLOGY IN THE MEDICAL CURRICULUM.

	Class A+.		Class A.		Class B.	Total.
	Full course.	First 2 years only.	Full course.	First 2 years only.	Full course.	
PRE-MEDICAL YEARS.						
Required for admission.....	1	..	2	..	..	3
Advised for admission	3	2	2	..	1	8
Pre-medical course offered	5	2	4	3	1	15
MEDICAL YEARS.						
Normal psychology required ...	1	..	..	1	2	4
Normal psychology elective....	1	1	..	1	..	3
Abnormal or path. psych. required	1	..	1	..	..	2
Abnormal or path. psych. elective	1	..	1	..	..	2
Planning to offer courses.....	3	..	2	1	1	7
Teaching in connection with other courses .....	..	..	8	..	3	11
Total requiring, advising or teaching.....	9	2	7	5	3	26
Ignoring psychology.....	6	..	15	..	9	30
Number replying to inquiries ..	17	2	22	5	12	58
Number of schools.....	24	..	39	..	22	85

PRE-MEDICAL TEACHING.

In only three schools is psychology required for admission.

In eight schools it is scheduled or advised, but not required.

In 15 schools, including all but one of these eight, pre-medical courses in psychology are offered—required in three, elective in 12.

The number of students electing psychology varies from a few to nearly all, but averages about half.

In these pre-medical courses the time occupied varies from a total of five hours to a full year's course of at least three hours a week. Most of those that give such courses teach it for one or two terms.

It is taught chiefly in the second, but sometimes in the first, of the two pre-medical years.

In only three schools has the teacher of psychology had any psychiatric experience, and in two of those it is "limited" or "slight."

Only five mention the text-books used. They are Angell, Seashore, James, Pillsbury, Titchener, Störring, Janet, etc.

The method was not stated in all cases, but appears to be chiefly by lecture, with considerable laboratory work.

TEACHING IN COURSE.

In the medical course proper, only six schools require psychology as a separate study, and five others offer electives, making 11 which teach it. Two more expect shortly to offer electives, and will probably do so next fall, while five others are trying to arrange for it, and may accomplish it within a year or two.

Eleven replies tell of teaching psychology only in connection with physiology or with psychiatry or neurology. In most this does not mean much, but in three it means that a definite number of lectures in the course on physiology or in that on psychiatry is devoted to normal psychology.

Of the 11 separate courses in psychology that are offered, four are described as "elements of abnormal psychology," "the application of psychology to neurology," "pathological psychology" and "psychopathology, psychology in its medical bearing." The other seven appear to be courses in physiological or more general psychology, in which such text-books as James, Titchener, Angell, Pillsbury, Yerkes, Thorndike, and Witmer are used.

The time devoted to psychology varies from 5 to 108 hours, averaging perhaps 45 hours.

It is taught in the first year in two schools, in the second in five, in the third in one, and in the fourth in three.

It is taught chiefly by lecture and text-book; in three schools there is also laboratory work; in one it is taught by lecture and recitation.

In six of these 11 schools, the psychological instructor has had no psychiatric experience; in two he has had slight, and in two considerable. One fails to reply to this question.

These data may be summed up as follows:

Of the 58 schools replying, 30 (over 50 per cent) quite ignore psychology; three require it for admission; eight advise it for admission; 15 offer pre-medical courses. During the medical years proper, six require it, five offer electives, seven are planning to teach it as a separate study, while 11 teach it more or less in connection with other courses.

It is probable that the amount of psychological teaching in the schools that sent no replies is less rather than more than that shown here.

It is of interest to note that in no curriculum that I have seen has psychology been mentioned as one of the fundamental sciences.

This state of affairs, though not good, is encouraging, for there is distinctly indicated by the replies received a growing tendency toward the introduction of psychology into the medical curriculum.

III.

The reasons for the lack of teaching and for the diversity where it is taught are various. They are grouped about two main lines, one the evolution of the science, the other the evolution of the schools.

About the middle of the last century the science of psychology grew out of philosophy. At that time Spencer's materialistic and mechanistic conceptions were influencing scientific thought, especially among English-speaking people. There was, however, no one accepted philosophy, but many philosophies with irreconcilable differences in fundamental concepts. The psychologies

which grew out of these philosophies inherited the defects of their parents, but showed a rather strong tendency to be influenced by the Spencerian environment into which they were born. So, as was natural with young sciences, they dealt chiefly with the concrete, tangible phenomena of sense perceptions, sensations, reflexes, time reactions, etc., and avoided the more elusive but more fundamental and vitally important factors that determine human conduct.

Owing to the irreconcilable differences, due to their origin, there has been no one generally accepted psychology, as there is one physiology, but several psychologies. Hence scientists in other fields have felt a certain distrust of all psychologies, just as they have of all philosophies; and owing to the avoidance of the vital factors which determine conduct, psychology has seemed out of touch with life, often impractical, and not especially helpful where the need for help has been felt. Even the recent growth of applied psychology, as seen in the latest book by Münsterberg and in the studies in animal and human behavior, has not been able to overcome psychology's hereditary defects, though approaching much nearer to what is wanted than earlier efforts did. What is needed is an application of eugenics to psychology. Out of biology, not philosophy, should the new psychology be born, sired by scientists of broad views, not unacquainted with, but unafraid of, the various philosophic viewpoints, and with courage to attack the most complicated and intangible of problems. Such a psychology would be a healthy normal science, well-developed, whose fundamental concepts, view-points and methods would be as generally recognized and accepted as are those of physiology. It would be found helpfully applicable to the various problems of life, and could be taught with as great advantage as physiology now is.

The medical curriculum long antedated the science of psychology. There was therefore no place for this science in the old curricula. The enormously rapid growth of the other biologic and seemingly more strictly medical sciences has been crowding and stretching the curriculum. Hence, though the importance of the psychic factors in disease has been increasingly recognized and the need of psychological investigation of them has been increasingly felt, it has been difficult to make a place for psychology in the medical course. The facts above noted, that psychology has not been a

unitary science and that it only remotely touched the needs of the medical student or physician, have delayed its inclusion as a required course. These are the chief general reasons why psychology is not more generally taught in the medical schools. Others are more local and personal to the individual schools.

IV.

At the above mentioned symposium and elsewhere three suggestions for courses in psychology have been published; one by a psychologist, one by a neurologist, and one by a psychiatrist. Each proponent illustrates the faults of his type, though it is only fair to say that each probably had the conditions in his own school in mind, and that this would greatly modify the plan proposed. It would take too long to even sketch them here, so I will merely offer a few comments.

Professor Watson,⁷ the psychologist, outlines a course with far too much physiological and far too little psychical psychology, and it is too little applied to the needs of the medical student. It makes one think of trying to teach architecture by devoting a great deal of time to building materials and comparatively little to design.

Dr. Prince,⁸ the neurologist, frankly states that the course he outlines is rather supplementary to Professor Watson's than a substitute for it. For a foundation course it lays altogether too much stress on morbid processes, on hypnotism, and on such uncommon conditions as dissociations and syntheses of personalities. Furthermore it is based on his not yet generally accepted theory of the subconscious. Except as an advanced course in psychopathology, it is uneven, with many parts too little and others too much accentuated.

The third, Dr. Meyer's,⁹ outline, is by far the best of the three. Especially good are the biological view point, the recognition of "relativity of effects" (which I call multiplicity or complexity of factors involved), and his insistence on observation and on study of factors which may modify reactions. He perhaps lays somewhat more emphasis on some of the Freudian mechanisms, such as symbolic disfigurements, substitutions, wish-fulfilments, etc., and somewhat less on effects of emotional states, education, formation of purposes, ideals, etc., than I should, thus including

a little more of morbid psychology than a preliminary course should have. But it seems a fairly well-rounded course, helpful to the general practitioner as well as to the specialist.

But destructive criticism is easy, and often thankless, while constructive planning is difficult. It may be hardly fair to criticize any of these suggested courses before they have been tried out, on merely *à priori* grounds, especially as those are the only basis of the following suggestions.

Since the medical curriculum is already so full, the psychology that is added to it should be limited to the actual needs of the student—it should be a strictly applied psychology, with its applications shown throughout the course.

That part of the course in physiology which deals with the nervous system and the special senses could be expanded to include the physiological psychology needed to understand the tests used by neurologists (including various time-reactions, tests for aphasia, astereognosis, etc.), ophthalmologists, otologists, rhinologists, and laryngologists, and to include also the somatic effects (motor, vaso-motor, secretory, etc.) of affective states in general, such as fear, depression, euphoria.

The course in psychology proper should be largely, though not entirely, an observational one, teaching the student to see what the various psychological factors are which determine the conduct and behavior of individuals in the ordinary acts of life. To this end it would be analytical and partly introspective. There should be as much experimental work as is needed to give an idea of the scope and application of the Binet-Simon and other general intelligence tests, free and controlled association tests, memory tests, attention tests, observation and reproduction (testimony) tests, etc. This would give the student a certain familiarity with the ordinary tests used in the investigation of the neuroses, the neuropsychoses, the psychoses, and the states of mental defect.

The student should be taught the factors and mechanisms involved in the learning-process and in habit-formation; in orientation and grasp of the situation in which the person finds himself; in instinctive action; in the formation of purposes and ideals; in the carrying out of the purposes formed. He should be taught the influence of the affects and affective states, not only on the body, but on the other psychical processes and contents; the

modifying effects on mental reactions (both as processes and as content), not only of such bodily conditions at toxæmias, fatigue, permanent or temporary destruction of nerve-cells or nerve tracts, imperfect development, etc., and of other psychic states and attitudes, such as recollections, prejudices, superstitions, and affects like shame, indignation, pride, etc., but also of education, experiences, habit and environment. And he should be taught the general directions in which these modifying factors produce their effects.

The course should be given from the biological standpoint—that all the activities of the individual are reactions to an environment or to other internal activities of his own; that these reactions are determined partly by the environment, partly by the bodily condition of the individual, partly by his capacity to react; and that any given act, no matter how simple-seeming, is complex and multiform, the resultant of a great many factors, many of which are unknown and any one or any number of which is capable of modification.

Some such course as this would prepare the student for the later study of formation of complexes and of delusions, automatisms, blocking, dissociations, thinking difficulties, defects, etc., in the courses on psychopathology and psychiatry. It should be given after the course in physiology and physiological psychology, and would need probably two semesters. The methods used would necessarily depend on the local conditions in each school and on the instructor.

The person who should teach psychology to medical students should know both psychology and medicine; and a knowledge of morbid mental states also is of especial value to such a teacher. Though several of the schools offer academic courses given by psychologists without experience in morbid mental phenomena, some schools question the value to the medical student of psychology as so taught and even the right of the faculty to make psychology a required study unless it be adapted to the needs of the medical student by men trained in psychiatry as well as in psychology. Hence a psychiatrist with a working knowledge of psychology or a psychologist with a knowledge of medicine and a familiarity with mental diseases would be the ideal teacher. The psychological interests of either should be not so much

in time relations, intensities of stimuli, and other factors testable and measurable by laboratory methods, as in the more elusive, less easily definable factors that enable the individual to adjust himself to the constantly changing situations, near and remote, in which he finds himself throughout his life. Though there are few such teachers now, if psychology is taught in the medical schools it will not be many years before there will be enough to teach it well, to the great benefit of the medical practitioners and the communities they serve.

V.

What can this association do?

In its membership are many teachers in the medical schools. If they could raise and agitate the question in their own faculties it would hasten the introduction of this study into those schools. I urge them to do this.

If the association could take official action, in the form of a resolution, strongly recommending the introduction of psychology into the medical curriculum, it would back up and add weight to the efforts of the individual members of faculties.

A committee could be formed to investigate further the present status, the results and the future possibilities of psychological teaching. The reports and recommendations of such a committee could be sent to the various medical schools, to the Committee on Medical Education of the American Medical Association, and to the Committee on Pedagogy of the Association of American Medical Colleges.

Through such efforts, and others that may occur to other members of the association, this desirable end may in time be accomplished.

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THE WIDENING FIELD OF PRACTICAL PSYCHIATRY.*

By WILLIAM L. RUSSELL, M. D.,

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The application of the knowledge and ideas which grow out of the study of mental disorders is the task of practical or applied psychiatry. The means employed are those which have been devised for the treatment and prevention of mental disorder in the individual and for dealing with it as a social problem. To a considerable extent they require for their application organized provision and methods usually of a public or semi-public character, and it is with these that this presentation will principally deal.

For many years the task of practical psychiatry was to obtain for the sufferers from mental disorder the simpler requirements of humane and rational care. After these had, in some measure, been accepted as essential to a satisfactory standard, further efforts became necessary in order to secure adequate organization and equipment for the purposes of scientific study and treatment. This has been and still is the task of the present generation. The object aimed at is institutional development with proper regard for the needs of the individual as well as for the safety and good order of society. This task is in itself sufficient to occupy the best thought and effort of those engaged in it and is still far from finished. Institutional development in this country has in the past been shaped and controlled principally with reference to custodial care. The influence and labor of the physicians who have always been engaged in the work have, however, brought about such advances in organization, equipment and methods for the purposes of scientific study and treatment that no organized system of care of the insane is now so poor as to lack some provision for them.

This much having been accomplished, it is now becoming evident that further adjustments will be needed in order to deal with the problem on broader lines. In social development generally a stage appears to have been reached in which the community as a whole is disposed to seek its own sanitary welfare and to

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devote public funds to this end rather than depend upon private philanthropy. Philanthropy, which formerly spent much in providing hospitals and other institutions for purposes of relief, is now more inclined to provide for studies in social problems and for experimental demonstrations of the best methods of dealing with them, with a view to leading society to provide for itself the permanent measures required. Thus, in New York state, the State Charities Aid Association started after-care for the patients discharged from the state hospitals of the metropolitan district and carried it on until its value had been demonstrated and it was taken over by the state. At present the association is engaged in trying to demonstrate the usefulness of out-patient departments and social-service work in dealing with mental disorder, with a hope that the state will eventually adopt them as definite features of its system. Much of the work of the large foundations, such as the Sage, Carnegie, and Rockefeller, and such organizations as child hygiene and child labor committees, tuberculosis committees and associations, sex hygiene societies, eugenics societies, mental hygiene committees and societies and other organizations, is carried on with, at least as one object, the informing and convincing of the public in regard to the advisability of applying for itself demonstrated remedies for existing social evils and defects. It is now recognized that disease, as well as crime and poverty, cannot always be adequately dealt with by specific measures applied to the individual, but that the conditions under which the individual failed must be studied with a view to readjustments, and to the application of such social remedies as may be needed. This method of dealing with disease has been generally accepted and a social-service department has become a recognized need in the work of every well-organized general hospital and dispensary. The patient is no longer regarded simply as a separate individual, but also as a social unit, whose cure cannot be considered complete until he has been restored to social adaptability and efficiency. Thus the purely humane and individualistic period in hospital development has given place to a period in which the broader needs of social hygiene and of social efficiency are understood, and the work is being shaped so as to meet more fully the vital issues both in individual and in community life.

It is evident that, in the further development of organized systems of dealing with mental disorders, this view of disease

and its treatment will be given more consideration. A period seems to have been reached in which it can be plainly seen that the skilled attention which has been given to institutional development will now have to be extended to other aspects of the problem of dealing with mental disorder in the individual and in the community. Already in the more highly organized systems new activities have gradually developed to this end. Provision for hospital care only, without regard to the neglect or ill treatment which the patient may be subjected to before he reaches the hospital or after he leaves it, can no longer be looked upon as fulfilling the requirements of an adequate system. It is now recognized that the problem of mental disease must be dealt with in closer relations with the conditions under which it arises. This view has already led to certain developments and extensions in the organized systems of care of the insane in various parts of the country. I shall refer specifically only to those which have occurred in New York state, not because they are necessarily the best, but because they will serve to illustrate and I am better informed in regard to them than to those of other states.

During the past few years the field of practical psychiatry in New York state has been extended in the direction of earlier and better attention to the cases before they have been brought under hospital treatment, and after they have been discharged. To this end, in 1910, medical health officers were substituted for overseers and superintendents of the poor as the officials to take the necessary steps for the relief of the cases met with in the various communities. This provided the foundation for a system of dealing with the problem medically by a steadily improving medical department of the state government. The health officers are, indeed, limited by lack of the proper facilities and by their lack of knowledge and training in practical psychiatry. It is possible, however, to overcome these limitations; in fact, in some places improved methods and facilities were established soon after the law went into effect, and several of the health officers have tried to increase their knowledge and efficiency. The State Charities Aid Association is also, in co-operation with local organizations and with interested individuals, carrying on a persistent agitation and effort for the establishment, in connection with general hospitals in the larger cities, of suitable psychopathic departments or wards where prompt medical and nursing at-

tention may be given to patients who may, if necessary, be later transferred to the state hospitals. In this connection it is interesting and instructive to note that the first organized developments in practical psychiatry in this country made provision for the treatment of mental disorders as part of the work of general hospitals. In the annual report of the Board of Governors of the New York State Hospital for the year 1797 the following statement appears:

"Persons laboring under incurable Decrepitude, or long continued Ailments of any kind, are considered as fitter Objects for an Almshouse than for this Hospital, which is properly an Infirmary, for the Reception of Such Persons as require—

Ist Medical Treatment.

IId Chirurgical Management.

IIId Maniacs, and

IVth It is in contemplation to fit up a Laying-in Ward, etc."

The intention was evidently to provide hospital treatment for the more acute types of mental disorder. In fact, cases of mental disorder were admitted to the hospital from its opening in 1793. In 1808 a special building for their sole use was provided. The ground plan of this building and the case records of some of the patients who were treated in it are still in existence and show that the standards were quite good. It is unfortunate that when, in 1821, following the world-wide movement for better provision for the insane generally, the Society of the New York Hospital established Bloomingdale Asylum outside the city, no provision for mental cases was retained at the general hospital. It was not until many years afterwards that it became so apparent that hospital provision near at hand was essential to even decent standards that a psychopathic or observation pavilion was established by the city at Bellevue Hospital. Still later, a corresponding provision was made at the King's County Hospital in Brooklyn. In 1902 a pavilion for the treatment of mental disorders was opened at the Albany Hospital. It is now recognized that a broad development of such provision throughout the state is essential to an adequate system of dealing properly with the cases as they occur in the various communities. This development should appeal to private philanthropy, as the public could be readily induced to provide for the support of such additions to the resources of the general hospitals if the buildings could be secured. In order that the standards and methods of local provision for dealing with mental disorder may be shaped and controlled by the state

it has been proposed that they be placed under the supervision of the State Hospital Commission. The legislation necessary for providing for this will undoubtedly be obtained in the near future. The greatest difficulties relate to making suitable provision for the prompt relief of cases occurring in the rural districts and in the small towns and villages. In order that no delay might be experienced in utilizing the state and private hospitals, provision was made a few years ago for simpler methods by which patients might be admitted on voluntary application or without a judge's order. During the past winter a provision for the admission of patients to the state hospitals for observation, similar to what is already provided in Massachusetts, was passed by the legislature as part of a general bill amending the insanity law, but the bill was vetoed by the governor. Another provision for bringing the state hospitals into closer relations with the communities which they serve has only recently been signed by the governor. This authorizes the state hospital superintendents, with the approval of the commission, to establish, at suitable locations within their districts, out-patient departments. A department of this kind has been conducted for some years at St. Lawrence State Hospital and for a shorter time at the Long Island State Hospital. The law recently enacted will permit of expenditures for the purpose. Out-patient departments for mental disorders are also conducted in connection with the psychopathic department at Bellevue Hospital, and in connection with some of the medical schools and general dispensaries. A special dispensary is also operated under the auspices of the State Charities Aid Association. There is also an out patient department, where mental cases receive attention at the Neurological Hospital. At most of these departments physicians attached to the hospitals for mental disorders are in attendance. Patients on parole from the state hospitals are referred to them with a view to observation and treatment. They will also serve a useful purpose by the discovery among those who apply of persons who are not safe to be at large. And they will provide places where skilled attention can be obtained for many cases of mental disorder who would, without this provision, be neglected or ill-managed.

The advances which have been made in provision for earlier skilled attention to persons suffering from mental disorders have reduced the extent to which the police are called upon in deal-

ing with the cases. In 1909 more than half the patients received at the psychopathic department at Bellevue Hospital were brought in under a police system. Since then the methods have been changed and a special ambulance and nurses are sent from the hospitals for the patients when a request is received from a physician, an officer of an organized charity, or certain relatives and other responsible persons designated in the law. This is in harmony with the state system which requires the superintendents of the state hospitals to send nurses after the patients whose admission to the hospitals has been arranged for.

The need of more attention to the domestic or social readjustment of patients who are under treatment for mental disorder has been made more clearly evident by the advances in psychiatry and by the more thorough work which is now done in the study of the cases. To provide for this after-care or social-service work has been undertaken. The result, in at least one state hospital in New York, has been a large increase in the number of patients who have been enabled to leave the hospital. Social-service work is also done in connection with out-patient departments and, with a view to the prevention of serious breakdowns, by the mental hygiene committees.

The work of the mental hygiene committees and societies has for its object the better treatment of persons who are suffering from mental disorder and the application of what has been learned about the nature and causes of insanity to its prevention. It has been made possible by the advances in psychiatry and by the general movement for social hygiene. It is a part of a phase in social development and it is the duty of psychiatrists, who alone have the necessary knowledge and judgment, to enter into it and shape and direct it in such a way that it may be practical and really useful. Wherever the work has been undertaken superintendents and other physicians attached to the hospitals for mental disorders have done much to bring about such success as has been met with. The work involves the spreading abroad of useful information relating to the nature and causes of mental disorder by means of literature, lectures, and exhibits, the promotion of useful legislation and of better measures of dealing with the cases and with the problem generally. Literature can be readily distributed to visitors to the hospitals for mental disorder simply by giving them an opportunity to take it. I have been surprised

to see how quickly it disappears when placed in the entrance hall of even a small institution. In New York state physicians attached to the hospitals have assisted in the preparation of literature and have delivered many addresses in connection with the work. An effort has also been made at some of the hospitals to cultivate closer relations with the medical practitioners in the neighborhood, with a view to mutual helpfulness. The physicians who have signed the certificates are invited to attend the staff conferences, at which the patients in which they are interested are presented. Brief abstracts of the findings in the case are sometimes forwarded beforehand. Special conferences are held, at which set topics are discussed, and the physicians in the vicinity or in the nearby city are invited to attend. At one of the state hospitals the superintendent has informed me that eighteen practitioners of the city have been present at the Saturday morning conferences. My own experience at Bloomingdale Hospital is also encouraging. To make the meetings successful, the topics should be chosen with reference to the illustrative material available. They should be presented in a simple, practical way, with a view to bringing out plainly and pointedly the natural history of the condition under consideration. A fair balance between organic and functional material is advisable in the program, which should be rather short. An informal, modest social feature will add to the occasion. There can be no doubt of the increasing interest of the medical profession in the subject of mental disorder and in the relation of mental states to conditions of ill-health generally. A comparison of the programs of medical societies and of the contents of medical journals of ten or fifteen years ago with those of to-day will convince any one of this. The advantages of this growing interest and intelligence in the work of dealing with the problem of insanity are apparent. Other organized movements which have for their object the promotion of sex hygiene, child hygiene, and eugenics, have also an important relation to the aims of psychiatry and need, in the practical work which is growing out of them, the special knowledge and experience of the psychiatrist.

This brief survey of some of the directions in which organized psychiatric activity is extending shows that in further developments provision must be made for broader lines of work than simply institutional care. The following features seem now to be essential for efficiency in any public system:

1. *State Organization.*—The whole system of public and private provision must be under some measure of direction and control by a central expert body.

2. *District Organization.*—This has on several occasions been advocated and outlined by Dr. Adolf Meyer; the state hospital of the district to be the central feature and the influence under which standards and methods should be shaped and controlled.

3. Local and medical officials, not poor-law officials, to attend to the local needs in providing for the cases which arise in each community. The methods of these officials to be under state supervision and control.

4. Local provision for prompt hospital treatment in connection with general hospitals or separate, but not in connection with almshouses or police provision. The confinement of insane persons as such in jails or lockups to be prohibited by law, as in New York state. Local provision to be under state supervision.

5. Prompt admission to hospital treatment to be facilitated by means of simple emergency procedures and admission on voluntary application. The transfer to the hospitals to be made by qualified nurses only, as in New York.

6. Out-patient and social-service departments to be established in connection with state and local hospitals and dispensaries.

7. The hospital physicians to cultivate mutually helpful relations with the medical profession of the district and the state.

8. Co-operation between the public system and organized official and philanthropic work for the prevention and for the better treatment of mental disorders.

These are features which are one by one, here and there, being added where the best systems of dealing with mental disorders prevail. They indicate the lines of progress. They are the outcome of the recognition of the need of a broader activity than that of institutional development only. Many centers and kinds of activity and many more workers are required to deal efficiently with the problem of mental disorder, to distribute the burden, and to bring about prevention. A system which will help to bring these into existence and will shape the standards and co-ordinate the work of all towards the one main object is what should now be aimed at rather than the perpetuation of almshouse methods or even of state care in a few widely separated large institutions.

PROBLEMS WITH THE INSANE.*

By L. VERNON BRIGGS, M. D.,

President of the Medical Staff, Boston Dispensary; Member of the Massachusetts State Board of Insanity; and Commissioner of the Alien Insane of Massachusetts.

I feel more and more, as I write of the mentally ill, the temptation to eliminate the word "insane." That word really conveys no more idea of the condition of our mentally ill than does the word fever convey to us any particular form of disease. Fever at the present time is considered only a symptom or consequence instead of a disease, with different manifestations, as was the case many years ago. Up to the present time the word "insanity" has, to a great extent, been used as comprehensively, or loosely. I believe that this society would do well to take some action tending to eliminate the use of the term, "insane," as connected with hospitals and their patients. If mental conditions are (as most of us expect will soon be proved) only symptoms or results of physical disease, the terms insane, mentally ill and mental disease will have to be done away with, and the illnesses from which the individual suffers, such as tabes, syphilis, pneumonia, typhoid fever, general paralysis, auto-intoxication, etc., will take their right places in our diagnoses. Certain forms of disease will then be classed as irresponsible and committable which will more clearly define the medico-legal case.

The construction of most of our present institutions for the mentally ill does not allow a proper classification. The result is that in most states, including Massachusetts, one finds under one roof acute and chronic patients, insane criminals, epileptics, feeble-minded, alcoholic and insane alcoholics, senile dementias and moral degenerates, and often several of these classifications in the same ward.

We should not foist the criminal insane on our unfortunates who are sent to the state institutions. The criminal insane should be a class by themselves. They need different treatment and supervision by men who have different training than that required

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

for the non-criminal. We are too far advanced in the treatment of the so-called insane to continue any longer with such heterogeneous groups to handle. If we are obliged to use our existing buildings, we should classify our patients, so that different classes should occupy different wards; for instance, there should be a group of the hitherto so-called early cases of dementia præcox in one ward, where intelligent work could be carried out by reeducational methods, such work as is now being done by Dr. LaMoure at our Gardner State Hospital. Other groups should be made so that each particular group may receive in its own ward the most skillful treatment tending toward improvement or recovery—more individual treatment.

While there should be a variety of occupation in each hospital to meet the therapeutic needs of individuals, every hospital should tend to excellence in one industry. In this way many patients who would otherwise be thrown into occupations in which they were previously engaged would be trained in other occupations, which would be more diverting to them and of more therapeutic value. At the same time the other institutions could depend upon certain hospitals for certain supplies, and each would feel an interest in supplying to the other institutions a certain product.

There is no question but the mentally ill should be treated as all other sick people are. They should not be sent to different parts of the state in isolated communities and forgotten, but be where they can receive the visits of their friends and relatives.

The public are now demanding that they shall receive active treatment with a larger percentage of cases discharged as cured or improved. They are not going to be longer satisfied with safe custody, or even comfort, kindness and skillful management.

Dr. William L. Russell says: "During the past twenty years a great change has taken place in the standards and methods and the public is rapidly learning to expect something more for the inmates of the institutions than simply safe custody, comfort, and kindness." Broader medical training and more elaborate equipments are necessary in the hospitals for the insane than for treating simple surgical and medical diseases in the general hospitals, instead of the reverse, which is now generally the case.

The rules and regulations of hospitals should include increase of salaries of the medical men according to their development and

length of stay. They should be allowed to marry and have home-like surroundings. These are among the inducements which should be held out to prevent the continual vacancies from which almost every staff suffers, and which means loss of efficiency.

In many states the superintendent, who is a physician, is the chief executive, does the purchasing, has charge of the new construction, and is so occupied by other necessary administrative duties that he has but little time for medical work. While the superintendent should be the chief executive, the business end of the institution should be so provided for that most of the superintendent's time would be given to his medical work.

An efficient purchasing bureau for all the hospitals, if properly run, should lessen the cost of supplies and increase their quality. It is true that a good many superintendents can keep track of the market and take advantage from time to time of the fluctuations, but this should not be the work of the superintendents. I wish to lay great stress on the fact that the superintendents, if they are the medical heads, should do the medical work, and not be business agents.

The present system of large, unwieldy institutions under one superintendent and often inefficient workers results in an economic loss and means that the taxpayers have to suffer.

One or more large training schools for nurses and attendants should be established in each state, or perhaps in each hospital, where the entrance examination should be at least the equivalent of a high school diploma. The student should receive a small salary and contract to remain while training. A diploma and a position in a state hospital with a competent salary, and with suitable accommodations, should be the inducements for such training. The results of such a service would soon be noticeable in the improved condition of patients, by a less number of employees required, and with a fewer assaults, etc.

If private patients are admitted to public institutions, either they should receive no different accommodations, treatment and food from the public patients, or else they should be entirely separated from the public patients, and housed in a house or houses in a different part of the grounds, with one or more physicians from the staff especially assigned to them, as is the case at the great Am Steinhoff Hospital in Vienna.

Each state should establish a psychopathic hospital and school where physicians who have had no previous experience in the care and treatment of the insane, but who intend to take positions in the state hospitals, should be required to attend certain prescribed courses. This central training school should be able to supply vacancies which are now difficult to fill.

There should, I believe, be a central laboratory, preferably at the psychopathic hospital in states that have one, where the pathological work of the hospitals should be carried on. In this way duplication of expense would be avoided, and more accurate and comparative work would be done. This does not mean that the state hospitals should not do some laboratory work.

The imposing type of institution built in blocks and from three to five stories high at a cost of from one to five thousand dollars per capita is, I am glad to say, becoming a thing of the past. The factory type should never again be used. Smaller and more home-like buildings are becoming popular, and I hope the cottage plan will continue to gain in popularity.

The modern institution for the insane should be so arranged that the reception service and hospital building for acutely sick should be separate from the rest of the institution; of fire-proof construction and not over two stories in height. An infirmary building should be provided of similar construction. Small buildings for very disturbed cases are needed, so planned that the excited patients should not disturb one another. These buildings should be homelike, attractive, and of colonial or some pleasing architecture.

I believe with Dr. Adolf Meyer in redistricting, and in the building of small hospitals serving the communities in which they are situated.

If plans now pending in Massachusetts are carried out for custody of defectives, of which there are probably as many as there are insane in the state, most of our older institutions could be used to advantage for them, and new hospitals for the mentally ill, of from 800 to 1000 as a maximum, could be built on the redistricting plan. With hospitals of more equal size distributed through the state, a better classification of salaries, rules and regulations would be possible, and a more highly educated type of person could be secured to nurse and care for the patients.

The time has come when each community should take care of its own, as Dr. Meyer is advocating in Maryland. He says: "There should be a more circumspect distribution of hospitals over the state, according to centers of population, and not merely according to cheapness of the land or possibly political considerations." "But here, again," he says, "we find an interesting fact; that the counties remote from the existing hospitals have fewer cases discharged and sent home than those nearer the hospitals." "Lack of interest, if it exists, is due merely to ignorance of the facts, to the tendency to institutionalize psychiatry, to consider it merely the business of asylums, and to forget that mental disorders often take months to form before they come to the notice of state authorities—months in which the most important chance for work should not pass without help from experienced quarters." "We must attack things in concrete cases, and in this respect the district idea, and the idea of small hospitals responsible for the health of their districts, must be the ideal policy of the state and the community." . . . "Instead of going on building large hospitals, with their pseudo-economy, we must aim to give well-defined districts what they need, not only to mend, but to prevent a gradual increase of burdens. A sufficient number of small, live, active hospitals, from which work can be done on the spot and according to the needs of the locality, means infinitely more than a few huge asylums and monuments of resignation, no matter what excellent work is done within them. As long as they fail to reach out, our hospitals for the insane are standing approvals of fatalism concerning faulty ways of conduct of life."

Opening the hospitals and judiciously inviting the public to more freely visit them, and educating the public through the social service and eugenics departments, and by papers or lectures read by the staffs, to gatherings in the communities, even having hospital visitors from the community, will tend to educate the public in the right direction.

An out-patient department connected with each hospital, though not necessarily on the grounds of the hospital, and the payment of small salaries to the trustees, composed of scientific as well as business men, who would be chosen from active lives, will tend, we hope, toward the solving of many problems.

As Commissioner of the Alien Insane of Massachusetts, I feel more strongly than ever that the alien insane are a problem of greatest importance. They form a very considerable part of our whole insane population. The work of the New York commission and others should be followed by every state and memorials and committees sent to Congress to urge better laws and treaty obligations. I hope we shall receive a valuable report at this meeting from the committee appointed last year. Government hospitals should take care of the aliens who are now taken care of by the several states for humanitarian reasons or because there is no other course open to them.

Social service should be connected with each institution. If properly organized such a service will improve home conditions throughout the state and prevent many duplicate commitments from the same family or environment. It will also facilitate early discharges by making a survey of cases in the hospital and a survey of the community conditions into which such patients will be discharged, that the paroled or discharged patient may be placed in the most advantageous surroundings on leaving the hospital or being transferred to what should be an ever-rapidly increasing group. I refer to the boarded-out patients. The follow-up work and after-care of the discharged cases to prevent a return to the hospital would greatly reduce the recommitments which now amount to a considerable percentage of our so-called insane population in institutions.

Money should be spent at the beginning for the prevention of insanity by social service* and similar agencies. It is just as much a necessity, if not a more crying need, than that many thousands of dollars should be spent at the terminal end of the disease in laboratories.

The Governor of Massachusetts sent the following message to the legislature this year:

* The Massachusetts State Board of Insanity at its meeting in August, 1913, voted to employ an expert in Social Service work to organize and systematize the work of prevention and after care in each of the State Hospitals for the Insane.

THE COMMONWEALTH OF MASSACHUSETTS

EXECUTIVE DEPARTMENT, BOSTON, May 5, 1913.

To the Honorable Senate and House of Representatives:

I transmit herewith a letter from Dr. L. Vernon Briggs, of the State Board of Insanity, urging the necessity of more effective supervision of the families of the inmates of our institutions.

In this connection I would draw attention to our present failure to accord adequate protection to the dependent wives and children of men who are shut up by the state in our institutions, whether because of crime, sickness or insanity.

Our institutions are conducted primarily for the protection of the public. At the same time, our system ignores very largely the fact that, in removing the bread-winner of a family, we expose that family to the very conditions of destitution and helplessness which are most of all conducive to crime and permanent pauperism.

We are, for example, sentencing drunkards to long terms of imprisonment, clothing, feeding and housing them, and giving them expert medical service. In a majority of cases these men possess some wage-earning capacity, but in shutting them up we permit their families to be turned out on the streets, to get what they can from public or private charity, or both. The time will come, in my judgment, when we shall recall this present practice with profound humiliation.

After mature consideration of the various classes of persons confined within our institutions, I have come to the conclusion that we should first of all consider the dependent families of those who are confined in our insane asylums.

Moreover, every step which the commonwealth can take to relieve our institutions of any of their charges and make them self-supporting and useful members of the community should be taken at the earliest possible moment; also every possible step toward the after-care of our mentally ill and the prevention of such illness.

These steps are requisite in view of the crowded condition of our institutions and the increasing demands for additional buildings.

I am informed on the highest authority that our present policy is leaning too much in the direction of merely shutting up mild cases of insanity.

In other countries—notably in Scotland—public policy has established a system of removing mild cases from the institutions and finding suitable private homes in which they may be cared for.

While we are now making, to a very limited extent a somewhat similar provision, I have become convinced on the testimony of officials connected with our institutions that we could probably discharge from five to ten per cent of the insane now confined in the institutions of the commonwealth if we maintained any adequate means of locating them either in their own homes or in other places in which they could be boarded out.

I would, therefore, direct the attention of the legislature to the recommendation made by Dr. Briggs in favor of the establishment of a so-called social service to be conducted by the state under the supervision of the Board of Insanity.

Social service as understood and practiced elsewhere to-day aims to furnish friendly advice and co-operation on the part of the state for the benefit of the wives and children from whom the wage-earner of the family has been removed through the operation of law. For example, a mechanic becomes suddenly afflicted with some form of insanity and public safety demands his immediate seclusion in an institution. Surely, the commonwealth owes some obligation to the wife and children who are thus suddenly and without any provision or warning deprived of their means of support.

In many instances friendly counsel and advice in regard to the economical organization and conduct of the household, or in respect to securing positions for the wife, and the children of proper age, would be sufficient.

Moreover, many insane people retain sufficient reason to brood over the helplessness of the families from whom they have been removed, and whom they have been forced to leave without protection. This fact in itself may be sufficient to preclude the hope of a cure in many cases.

I believe that social service work should also be established with respect to the families of our prisoners, and that the latter should be more efficiently occupied in productive labor.

I have repeatedly called public attention to this latter consideration, and am confident that the pending reconstruction of our penal system will result in the establishment in Massachusetts of much needed improvements.

I transmit the accompanying letter from Dr. Briggs, and with it the draft of a proposed statute, in the sincere hope that this legislature will take cognizance of the conditions herein set forth and will make a beginning, at least, toward an ultimately complete provision for the protection and assistance of the families of our insane, in all cases where other than public means are lacking.

If we continue to ignore the possibilities of this modern method of providing for the insane, we must continue to make rapidly increasing appropriations, as at present, for the permanent state custody of practically all cases of insanity within the commonwealth, however mild the form of the disease may be.

EUGENE N. FOSS.

THE COMMONWEALTH OF MASSACHUSETTS.

Boston, April 25, 1913.

GOVERNOR EUGENE N. FOSS, *State House, Boston, Mass.*

My Dear Governor Foss:—While the present legislature is in session I hope you will present to them the need of taking some action toward

definitely and intelligently stopping the increase of the state's dependents. Up to the present time the state has in the main devoted its resources to housing propositions so far as this class is concerned. I feel that the commonwealth should now take immediate action toward the prevention of the constant increase in this class who are multiplying faster than we can build institutions to accommodate them.

Social service properly organized is our first great step. This does not mean a body of untrained volunteer workers untactfully entering the homes and grappling with the private affairs of our citizens, but a body of trained workers without regard to sex or creed who experience has proved are welcome in every home and community in our land. They can do as good or better work among the mentally ill than is now being done by an army of faithful workers to stamp out tuberculosis throughout the state.

One or two of our state hospitals are doing some work along social service lines and one or two are doing some work on eugenics, but there is no organized work and no means have been provided for organizing and carrying the work out properly.

If the state would provide the small amount of money necessary to organize this year it would be saved the care of a good many dependents who will have to be taken care of the rest of their lives if we delay another year.

Sincerely yours,

L. VERNON BRIGGS.

It is obvious that money spent for the prevention of insanity will be a saving of intelligence as well as money to the state, but in spite of this fact thousands of dollars are spent in housing terminal cases and in laboratories for the study of pathology, and, with two or three exceptions, there is not a state in our union that is spending any money in organized prevention. In closing my paper I quote the following from the 6th Annual Report of the Trustees of the State Lunatic Hospital at Worcester, Mass., for 1838, of which Horace Mann was chairman. They say: "The great object at the hospital is the cure of insanity or the mitigation of its sufferings. The great object of the state and of individuals should be its prevention. The hospital is succeeding pre-eminently well in accomplishing the former; what can be done by the state and by individuals to effect the latter purpose?"

OCCUPATION AS A REMEDIAL AGENT IN THE TREATMENT OF MENTAL DISEASES.*

By ARTHUR V. GOSS, M.D.

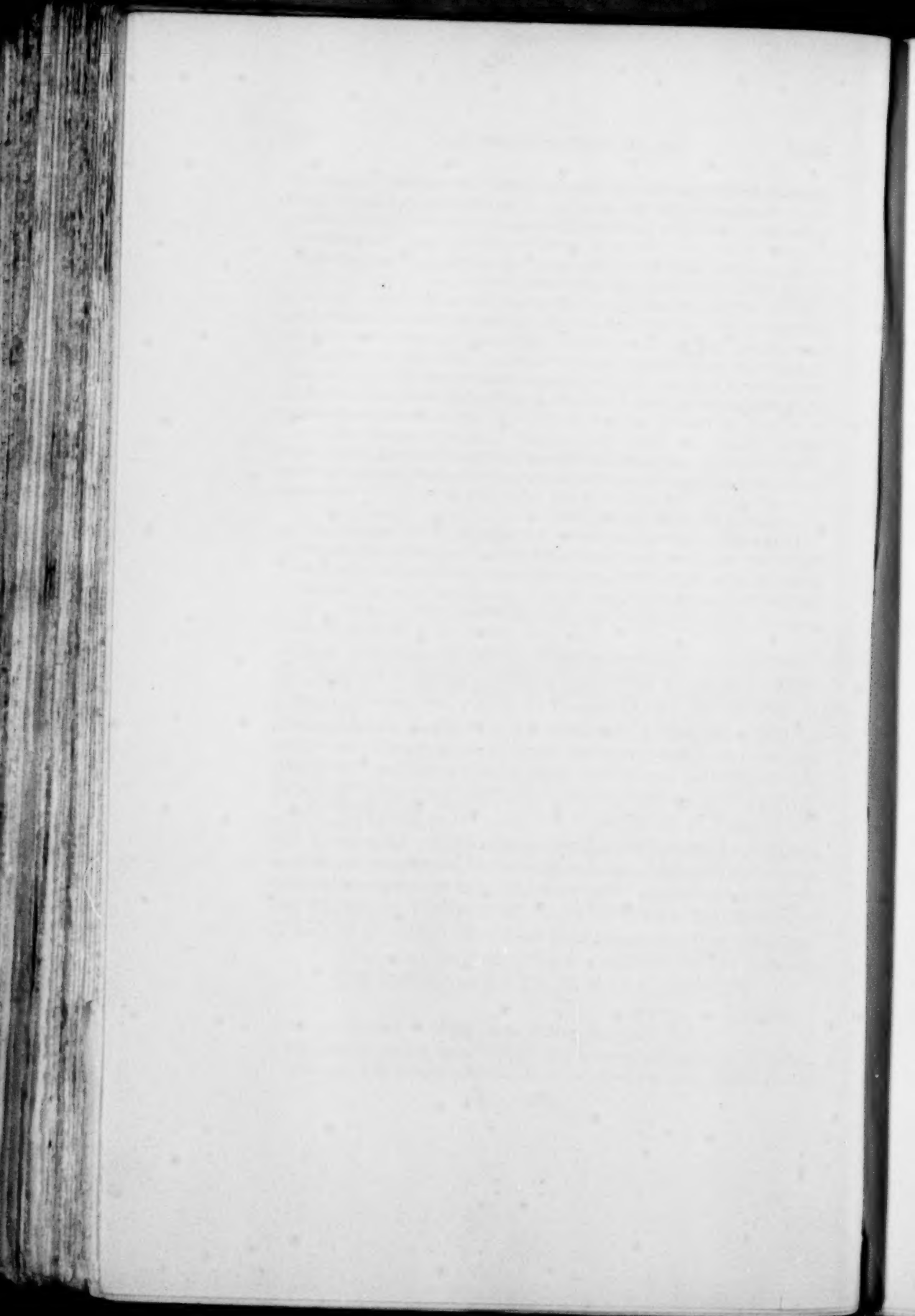
Theologians formerly taught that in consequence of the sin of our remote ancestors, Adam and Eve, the Deity imposed upon mankind the curse of labor; but the theologians were wrong, as usual, for universal experience has taught that labor is a blessing, while idleness is a curse.

A philosophical divine of the last generation used frequently to preach upon "Hope"; upon which occasions he always made use of the familiar quotation, "While I breathe I hope," transposing it, however, to read "while I hope, I breathe." In like manner we should say *not* "while I live I labor," but "while I labor I live"; for we only live while doing our part of the world's work, and when we cease to labor, we cease to live, and the great world moves on without us. Idleness, either voluntary or enforced, is a living death.

That suitable employment is the best remedy for many ills of mind and body, has long been recognized. Of late years, however, its value has begun to be more generally appreciated; also the important fact that its benefits can be extended to a much larger number than was formerly believed. Among no class of patients are the beneficial effects of employment more marked than among the insane in our hospitals. Employment as a remedial agent has been made use of in the Taunton State Hospital from the time it was opened in 1854 until the present time, a period of nearly 60 years. It cannot be otherwise than interesting and instructive to consider what results have been obtained and what conclusions drawn in consequence of the employment of patients in this institution during this long period, and my paper will be confined to considering the use of employment as a remedial agent in this hospital only. In his first annual report for the year 1854 the first Superintendent, Dr. George C. S. Choate, writes as follows:

In traversing the halls of lunatic hospitals, even those where no expense has been spared in any department, every person must be struck with one

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.



OCCUPATION AS A REMEDIAL AGENT IN THE TREATMENT OF MENTAL DISEASES.*

By ARTHUR V. GOSS, M.D.

Theologians formerly taught that in consequence of the sin of our remote ancestors, Adam and Eve, the Deity imposed upon mankind the curse of labor; but the theologians were wrong, as usual, for universal experience has taught that labor is a blessing, while idleness is a curse.

A philosophical divine of the last generation used frequently to preach upon "Hope"; upon which occasions he always made use of the familiar quotation, "While I breathe I hope," transposing it, however, to read "while I hope, I breathe." In like manner we should say *not* "while I live I labor," but "while I labor I live"; for we only live while doing our part of the world's work, and when we cease to labor, we cease to live, and the great world moves on without us. Idleness, either voluntary or enforced, is a living death.

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great event which stares him in the face at all points. I mean the lack of occupation.

At least two-thirds of the inmates of lunatic hospitals are capable of some employment and need it, as much as sane people, or more; and yet even in institutions where the greatest pains *have* been taken to introduce new amusements, and everything which can make the time pass agreeably and profitably, a large portion of it is spent by most of the inmates in sheer apathy and idleness.

In acute cases, after the excitement has passed away, I believe that employment of some sort is more important than it is in any other situation in which a man can be placed. The great object of treatment in such cases must obviously be to direct the attention from self, from the subjects of delusion, and fix it, without exercising it too severely, on some other interesting object. This can in no way be so effectually done as by interesting the patient in some occupation.

In melancholy cases, what so likely to be beneficial in calling the mind away from gloomy meditations? And in all how necessary is employment to induce sleep, which is so frequently disturbed in insanity, and to promote the health of all the animal functions, which is so important to health of mind.

During this first year 30 per cent of the men were employed at farm work and 17 per cent of the women at domestic work in the different departments. Dr. Choate, in this same report, asked for work-shops for both sexes, but especially to employ the men during the long months of winter, when farm work was insufficient.

He did not get the money to build his work-shops, and in his reports from 1856 to 1860 he deplored the lack of sufficient suitable employment for men; but from 1861 to 1869 the tone of his reports changed materially.

The commission which purchased the land for this institution was evidently endowed with the same degree of wisdom with which other similar commissions have been blessed, for they purchased an exhausted farm, consisting of a barren, sandy hill, surrounded by about 140 acres of scrub and swamp plentifully strewn with rocks of all shapes and sizes. Dr. Choate set his patients to clearing off the rocks and under-brush, draining the swampy portions and gradually building up profitable farming land.

Each report from 1861 to 1869 records more men employed. Their works remain to-day, lasting monuments to their labors and to the wisdom that directed them. In the meantime women

patients in increasing numbers were employed at various forms of domestic work and sewing.

In this particular instance the failure of Dr. Choate to get his work-shops was a blessing in disguise, for the employment of patients was thus started and directed along lines beneficial to all concerned, regarding the hospital as a co-operative institution or community, while otherwise the labor of the patients would most likely have been commercialized and consequently much less beneficial.

Dr. Choate resigned in 1869 and was succeeded by Dr. W. W. Godding. In his first report for the year 1870 Dr. Godding writes:

The problem how to occupy the idle and aimless lives that meet you on every hand among the insane is very difficult of solution. Labor, when it is cheerfully taken up, especially out-of-door labor, is undoubtedly the safest and best occupation. In this direction our farm is and will continue to be a source of income. The crops of health that can be taken off of it are inexhaustible.

Dr. Godding's reports from 1870 to 1876 record the results of his successful endeavors to furnish varied employment for both men and women. The report for the year 1876 is a very important and valuable one, as it clearly sets forth the status of the employment of patients at that time and the principles upon which it was conducted. These principles remain in force at the present time, somewhat modified by time and circumstances, but unchanged in the main.

They are as follows:

I. All patients who are physically able should be interested in some suitable employment as soon as the acute symptoms of their mental disorders have subsided.

II. Effort should be made to provide employment that is best adapted in kind and amount to the condition and needs of the individual patient.

III. Occupations engaged in by patients should be, for the most part, those of direct value to the hospital, regarded as a co-operative community.

IV. Parole should be granted to suitable able-bodied patients who engage in some employment.

Of these principles Nos. I and IV have been modified by time and experience. At the present time we do not wait for the acute symptoms to subside before interesting the patient in some occupation, and while we do not grant parole to able-bodied patients

who will not work, we do grant parole to suitable patients who are not physically able to work.

Dr. Godding resigned in 1877 and was succeeded in 1878 by Dr. J. P. Brown. In his annual report for the year 1881 Dr. Brown describes at length the variety of occupations in which patients were encouraged to engage and closes as follows:

There can be no doubt that many are benefited by suitable labor, and every physician of extended experience in the treatment of insanity has seen not a few cases where systematic occupation gave the first impulse to recovery. What is needed is diversity of employment to meet different cases. Work as a curative measure should suit the taste of the individual, that it may give pleasure to the mind as well as exercise to the muscles.

During the whole of Dr. Brown's administration, from 1878 to 1906, the employment of patients grew normally and steadily with constantly increasing variety.

During his administration in two instances the labor of patients was employed commercially, but in both instances it was abandoned, as it was found best to confine our output of manufactured articles to our own needs and to divert the extra labor into other channels.

Coming to the present time, the old New England co-operative community, although not so called, producing all the necessities of life by the labor of its members, was an ideal industrial community. That an institution can only distantly approximate to such a community is very likely true, but that is the ideal towards which we are striving, and the closer that we can approximate to it the nearer we shall draw to success. Our industries have been developed and are organized along lines of utility—for the most part. At the present time we are introducing others less useful, but more ornamental. These, however, are secondary and accessory to the more useful ones.

During the year ending September 30, 1912, out of a total number of 1598 patients under treatment 1190—672 men and 518 women, or 74 per cent of the whole number of persons under treatment—were engaged in some employment. Out of a daily average number of 1034 persons under treatment about 687—394 men and 293 women or 66 per cent—were engaged in some employment. Of these 480, or 69 per cent, were engaged in other than ward work.

We try to promote industry as far as possible by classification. Our reception wards are in two divisions; the acute division and the industrial division. As soon as the most acute symptoms have in a measure subsided the patient is taken to the industrial division, where he finds an atmosphere of industry, nearly all doing something; some of course more than others, and he naturally goes with the current.

Observation on these reception wards during the past year show that about 75 per cent of admitted women begin to take up some occupation within ten days after admission, and about 50 per cent of admitted men within the same period. The greater proportion of women is due largely to the fact that there is a greater variety of in-door occupations that women readily take up than in case of men. We are now striving to increase the variety of in-door occupations for this class of men.

As the patient's symptoms improve he goes to a convalescent ward, where greater freedom prevails, and from there home when sufficiently restored, or if his mental trouble proves to be of the more chronic variety he goes either to the colony group or to some ward where he will best classify. A comparatively small residuum is relegated to that eye-sore to all hospital men, the refractory ward, and even here, something is done by way of occupation, though not as much as we hope to do in the future.

Now let us briefly review the various industries and kinds of employment conducted in this institution at the present time. First, there is the daily routine work of the hospital, the farm, kitchen, laundry, stable, engineer's department, domestic work of all kinds, etc., in all of which patients take an active part.

The very best work for the men we have found to be work on the farm and grounds, and a large number are so employed; for a certain number, however, in-door work seems desirable and we have several shops in which such are employed.

On our farm we are now producing our milk, pork, eggs, small fruits and vegetables, with the exception of potatoes, of which we only raise a part, and considerable hay and fodder of various kinds for our stock.

In our shops we make and repair all our boots, shoes, slippers, moccasins, all men's clothes, with the exception of underwear and stockings; all our mattresses and pillows; and we repair,

renovate and upholster furniture. We also make brooms, brushes of various kinds, door mats and various kinds of heavy baskets.

For the women we have found, for the majority, domestic work and sewing to be the best. In regard to sewing, we do not have a sewing-room, but do all our sewing on the wards. This method experience has taught us to be the best. One of our principles is that all work should be done in the manner most natural to the doer. It is natural for men to go to the field and shop, but women do their work, however varied it may be, at home. Women patients working thus on the wards make and repair all clothing for women except knit underwear and stockings, all table linen, bed linen, and the thousand and one articles used about a large institution. They also make up men's clothing cut in the tailor shop, knit stockings, make wool puffs (which we use to a considerable extent instead of blankets), various kinds of rugs, numerous fancy articles, embroidery, lace of various kinds, baskets, etc. Very few things made are sold, as our endeavor, as before mentioned, has been to develop our industries entirely along co-operative lines.

Although women's work is mostly in-doors, during the summer months for several years past some women have been employed at such out-of-door labor as cutting greens, gathering peas and beans and picking small fruits. This out-of-door work we have found most beneficial and we hope to extend it in the near future.

All patients not paroled, employed in the laundry or shops work half a day only, thus having time for out-of-door recreation.

Our pupil nurses receive industrial instruction as part of their school course.

Here, if you will pardon me, I will introduce a few very dry facts to illustrate about how our work is distributed. Take, for instance, October, 1912, this month being selected as a good average month for all industries.

During this month out of a total number of 1105 patients, 600 men and 505 women, 769—415 men and 354 women, or 69½ per cent—were in some way employed. Of these, 233—136 men and 97 women—were employed assisting the nurses at ward work, 88—35 men and 53 women—were employed in the different dining rooms, 5—2 men and 3 women—in the nurses' home, 30

—18 men and 12 women—in the kitchen, 71—43 men and 28 women—in the laundry, 115 men on the farm and grounds, 14 men in the shoe shop, 16 men in the tailor shop, 3 men in the mattress shop, 7 men in the broom and repair shops, 6 men with the engineer, 1 man with the mason, 3 men with the painter, 1 man in the laboratory, 4 men in the store-room, 5 men in the bake shop, 2 men in the library, containing about 3000 volumes, they taking entire charge of same, 2 men marking clothes, 117 women sewing, 8 women lace making, 10 women at raffia work and basket making, 10 women knitting, and quite a number working at various unclassified occupations.

The accompanying tables show how the labor of patients has been distributed during the year ending September 30, 1912, and also the number of some of the most important articles produced during that period.

We have found employment beneficial in a great majority of cases, and especially in those suffering from the more curable forms of insanity. Take that large group called, for lack of a better name, manic-depressive insanity. Those suffering from manic symptoms are over-active mentally and physically and have a great superabundance of energy. If, after the most active symptoms have subsided, suitable employment is provided to direct their activity and energy along normal channels, speedy convalescence and an early recovery is often promoted, while if employment is not provided this activity and energy is too often directed into mischievous and perverted channels and convalescence correspondingly retarded.

Patients suffering from depressive symptoms present a feature diametrically opposite. Instead of exhilaration, activity and energy, we have depression, inactivity and lethargy. The patient needs to be stimulated and interested in something outside himself to counteract his morbid introspection and apprehension, and for this purpose nothing is better than suitable employment. Convalescence often dates from the time when employment begins.

Cases of neurasthenia are markedly benefited by employment, in spite of the fact that only aggravated cases are committed to hospitals. I have in mind a case that illustrates this point. This patient had lain in bed for five years, nursing a most uncomfortable bunch of hypochondriacal delusions. By continual and

NUMBER OF WORKING PATIENTS PER MONTH FROM OCTOBER 1, 1911, TO OCTOBER 1, 1912.

	October.			November.			December.			January.			February.			March.			April.			May.			June.			July.			August.			September.				
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.					
Farm and grounds.....	87	..	87	85	..	85	79	..	79	72	..	72	69	..	69	76	..	76	83	..	83	84	..	84	98	..	98	8	106	75	29	104	88	34	122	90	..	90
Laundry.....	41	23	64	39	17	56	26	64	41	24	65	46	24	70	42	31	16	43	13	27	69	44	25	69	43	21	64	43	20	63	33	14	47	54	24	78		
Kitchen.....	18	13	31	17	13	30	16	12	28	15	12	29	14	11	25	13	10	23	14	13	27	17	13	30	16	12	28	15	12	29	14	11	25	13	10	23		
Sewing.....	117	117	..	117	117	..	117	117	..	117	117	101	102	105	105	105	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Ward work.....	111	98	209	122	107	229	123	107	229	111	98	209	123	107	229	122	107	229	111	98	209	123	107	229	122	107	229	111	98	209	123	107	229	122	107	229	111	98
Dining room.....	39	25	64	47	25	72	30	17	47	30	17	47	30	17	47	30	17	47	30	17	47	30	17	47	30	17	47	30	17	47	30	17	47	30	17	47	30	
Nurses' homes.....	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6	3	
Shoe shop.....	12	12	14	12	14	16	12	14	16	12	14	16	12	14	16	12	14	16	12	14	16	12	14	16	12	14	16	12	14	16	12	14	16	12	14	16	12	
Tailor shop.....	13	13	16	13	16	18	13	16	18	13	16	18	13	16	18	13	16	18	13	16	18	13	16	18	13	16	18	13	16	18	13	16	18	13	16	18	13	
Mattress shop.....	5	5	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4		
Carpenter shop.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Repair and broom shop.....	3	3	3	3	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3	
Reinforced concrete.....	21	21	21	21	21	18	21	18	30	17	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
Bake shop.....	4	4	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
Boiler house.....	8	8	8	8	8	7	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7		
Masons.....	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
Store room.....	4	4	4	4	4	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
Raffia and basketry.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lace making.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Laboratory.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Office.....	1	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
With porter.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
With matron.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Library.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Marking room.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Knitting.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Picking hair.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ravelling.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

persistent effort she was induced to employ herself, and, in consequence, became sufficiently restored to get along outside and to be at least partially self-supporting.

In the less curable group of cases, like chronic alcoholism and dementia præcox, in which recoveries are few, remissions are not infrequent, and many cases are permanently arrested. We have found employment to be one of the most efficient agents to promote these results.

PART OF WORK DONE BY PATIENTS AT THE TAUNTON
STATE HOSPITAL FROM OCT. 1, 1911, TO OCT. 1, 1912.

Manufactured.		Repaired.
1029 Corn brooms,	682 Shirts,	2767 Pairs shoes,
118 Finger-nail brushes,	66 Bosom shirts,	7176 Pairs socks,
252 Scrub brushes,	415 Nurses aprons,	351 Mattress ticks,
77 Horse brushes,	433 Nurses apron bibs,	731 Wrappers,
24 Braided door mats,	1248 Aprons,	667 Undershirts,
326 Pairs shoes,	10031 Towels,	464 Pairs drawers,
335 Pairs slippers,	1104 Hair mattresses,	460 Shirts,
421 Pairs moccasins,	933 Hair pillows,	4990 Coats, repaired
3589 Sheets,	418 Coats,	and pressed,
1553 Draw sheets,	154 Vests,	3372 Vests, repaired
4027 Pillow slips,	571 Pairs pants,	and pressed,
576 Wrappers,	100 Pairs overalls,	7265 Pairs pants, re-
784 Nightdresses,	10 Rugs, nooked,	paired & pressed,
987 Skirts,	199 Laundry bags,	675 Chairs, repaired,
206 Wool puffs,	264 Screen covers.	scraped & varn.

We have at the present time many cases of chronic alcoholism and dementia præcox that have remained stationary for years, where in our opinion, further degeneration has been prevented by steady, congenial occupation. Even in the group of least-curable disorders, many cases are found that are rendered more comfortable by suitable employment.

Many demented patients are markedly benefited and rendered more comfortable. Many of these patients who, from sheer indifference and lack of energy acquire untidy and pernicious habits, by employment are rendered fairly tractable and tidy, more comfortable, and further degeneration is checked to a greater or less extent.

One of our wards devoted principally to the care of the more appreciative class of chronic women patients, by a combination

of circumstances had become so steeped in idleness and apathy that the very atmosphere seemed leaden and lethargic. So marked was this condition that we did not dare, as a rule, to put a convalescent on that ward, lest her convalescence be retarded. Recognizing that the condition was pernicious and to be corrected, by persistent and continued effort we succeeded in inducing the great majority of the patients to employ themselves to some extent, the result being that, as the result of our year's work, the atmosphere of the ward completely changed, the patients became more cheerful and contented, less fretful and fault-finding, and instead of being drones, they contributed largely to the work of the community.

Another ward occupied by a like class of men was in a similar condition; and now every patient pursues some occupation, and it is a favorite ward on which to care for convalescent patients.

Patients suffering from acute delusions and hallucinations are markedly benefited by occupation. We have many such under treatment at the present time. One patient especially sat all day on the ward completely absorbed in and controlled by hallucinations until he was induced to try and work at his trade—making baskets. Beginning rather hesitatingly, he soon became interested, and in a few weeks established a new industry to the benefit of the hospital, with the result to himself that his hallucinations became nearly dormant and he was once more able to enjoy living. In this instance greater obstacles than usual were overcome, as it was necessary for him to make most of his tools and select and fell the timber from which to make his basket stock, as we were unable to buy any prepared stock. In the doing it, however, he derived the greatest mental benefit.

In thus presenting a review of our experience in the employment of patients as a remedial agent in the treatment of mental disease, we would not have you infer that we feel that we have accomplished great things, for we realize that we have only made a beginning, but our experience has convinced us that employment is a most valuable remedial agent, and that any one who fails to avail himself of it is losing the help of a most valuable means of treatment.

THE CONGREGATE DINING-ROOM AND ITS MANAGEMENT.*

By ARTHUR H. HARRINGTON, M. D., HOWARD, RHODE ISLAND.

At the annual meeting of this association in 1895 a paper was read by Dr. Charles W. Pilgrim, entitled "The Dietary of the New York State Hospitals." In the closing paragraphs of this paper Dr. Pilgrim made an allusion to the congregate dining-room in connection with hospitals for the insane.

The apparently somewhat incidental mention of the congregate dining-room in this paper caused the greater part of the discussion which followed to center around the congregate dining-room. Those participants in the discussion who condemned the congregate dining-room were very largely in the majority. Whether the congregate dining-room has grown in favor since that discussion eighteen years ago it is not the purpose of this paper to attempt to determine. I do not start out with the fixed purpose of holding a brief for the congregate dining-room. What I do say, at the very opening of this subject, is that the congregate dining-room may easily be a dismal failure if it is not properly managed. I believe that the lack of a proper appreciation of certain essentials of the congregate dining-room and a failure to apply certain principles in its conduct are the causes of the condemnation of the congregate dining-room which we have often heard.

With the recognition and adoption of certain essentials and principles, I believe that the congregate dining-room may be made a feature which will have a distinct advantage, both from the managerial standpoint and from the standpoint of benefit to the patients in large hospitals for the insane.

When I speak of large hospitals I mean those having approximately one thousand patients and over. When I refer to the large congregate dining-room I mean one accommodating approximately five hundred patients and over. The maximum limit of accommodation I do not consider it necessary to fix, for under the system which I shall describe a dining-room accommodating two

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

thousand, in my opinion, can be managed just as satisfactory as one of five hundred.

The character of the patients may differ somewhat in different sections of our country, but I think that as a rule from 50 to 60 per cent of all patients in the large hospitals for the insane can be properly treated in the congregate dining-room.

When I say treated I am using that term advisedly, for the congregate dining-room, from first to last, should be employed as a therapeutic measure and not as a mere means for the collecting of patients in order to furnish them with the requisite number of food calories.

The first cardinal principle, therefore, to be kept in mind is to aim at therapeutic value in the conduct of the congregate-dining room. The second cardinal principle which I enunciate is that there should be an application of efficiency methods to every operation connected with the serving of meals.

I wish to say here that I do not claim originality for everything which I present. When I succeeded to the superintendency of the Danvers State Hospital in 1898 I found that my predecessor, Dr. Charles W. Page, had established there a congregate dining-room having the general features to which I have alluded. In 1904, under the administration of the late Dr. George F. Keene, there was completed at the State Hospital for the Insane at Howard, R. I., following the general features of the congregate-dining-hall at Danvers, a dining-hall building of excellent architectural design. Since succeeding to the superintendency of the State Hospital for the insane at Howard I have given much thought and experiment to the management of the congregate dining-room, and what I shall have to offer now is drawn from my experience, observation and personal contact with the work of conducting a large congregate dining-room.

Let us inquire now how this therapeutic value, of which I speak, can be obtained. First, the architectural feature should be given prominent consideration. I believe that the best result is obtained by creating for the dining-room space a separate building of one floor, built practically upon the ground level at the center of the plant, with only the basement under it. The space should have generous height, thus affording means for making ample provision for light and ventilation, two very important considerations

when we remember that 500 or more persons are to occupy the hall for a considerable space of time. Opening out of the rear of this hall there should be the main serving room, containing tea and coffee urns and dish-washing machines for the table dishes, and beyond this the main kitchen and the bakery of the institution.

A study should be made of the internal construction and decoration of the hall, in order to avoid a cold and barren effect. This can be done by breaking up space by means of columns and brackets supporting the roof, one or both. If the brackets and roof or ceiling timbers are of wood, a pleasing effect may be produced by a natural finish, the spaces between the ceiling timbers being plastered, and the walls and ceilings painted with appropriate colors. Decoration by means of natural or artificial plants should not be overlooked. A stage or platform should be provided for a small orchestra, which should play through the entire meal. A space should be provided for visitors, which can be done by means of a gallery at one end of the dining-room. Entertainments can be given from the stage, either during the meal or immediately after, the patients not leaving their places.

The contrast between such surroundings and accompaniments as I have described and a congregate dining-room, where no attention has been paid to these matters, is very wide. What has been done in the first instance is that an appeal has been made to the aesthetic sense, which as we all know, is not by any means dormant in the great majority of our patients; in the second instance that appeal has been wholly neglected. The result, in the first instance, is that we bring a wholesome psychic factor into the daily life of the patients, and from this I am assured, from my observation, that we derive a therapeutic value. This is what I mean when I speak of conducting the large congregate dining-room in such manner as to make of it a therapeutic measure.

We come now to the consideration of efficiency as applied to the various operations of the serving of meals. This requires that nurses and attendants shall be instructed and drilled in their work; that one thing shall be done at a time and at the same time throughout the hall; that the same order be followed out each day; that every stage of the meal shall begin and end at the same time; that there shall be no hurrying; that various ways

shall be devised for cutting out the unnecessary handling of food between the cooking apparatus and the patient; that all hot foods shall be kept in bulk, as far as possible, up to the moment of delivery to the patient.

With these statements I will give a brief description of the congregate dining-hall at the State Hospital for the Insane at Howard, and I will also describe the progress of the meal served at the dinner hour.

The floor space of that portion of the hall where patients are seated is 146 feet by 100 feet. The seating capacity is 896, which is giving each person a little over 16 square feet. Opening at one end of this dining-room is the main serving room, and connected with this serving room by corridor are the kitchen and bakery. Over the serving room space is a gallery for visitors, which can easily seat 150 people. At the opposite end of the hall from the serving room is the stage, where the musicians are seated and play during the meals. This stage is, moreover, large enough to accommodate a large chorus of singers or a full band or orchestra. At the outside wall the distance from floor to ceiling is 22 feet. For a distance of 25 feet from the wall on each side of the hall the roof slopes upwards and 25 feet from the side walls the height from the floor to ceiling is 28 feet. Twenty-five feet from the side walls on each side, lengthwise of the hall, are seven iron supporting columns. Widthwise of the hall the distance between these columns is 50 feet. Running the whole length of the hall for a space 50 feet wide the roof is of the monitor type, having transom windows which are operated in four sections from a worm gear, which is easily within the reach of a person standing on the floor. The distance from floor to ceiling throughout the central portion of the hall is 39 feet. The windows upon the side walls are large openings and they, together with the transoms, afford a very light room, which can be easily ventilated. Running the whole length of the hall on the side walls is a slate shelf two feet in width, which serves as a sideboard. The building is warmed by direct-indirect radiation, the coils being in iron boxes just under the slate shelves. These iron boxes have grill work a few inches down from the top on the front and sides. Wherever these boxes occur the slate shelf over the coils becomes sufficiently hot, so that the table crockery, being placed there

between meals, is warmed for the coming meal. The walls of the hall are painted in terra cotta and the ceilings in a light tan. Each column has a circular shelf extending around it, which is at a distance of $9\frac{1}{2}$ feet from the floor. This shelf is 20 inches wide and serves as a place for potted ferns, which add much to the decorative effect of the hall.

The patients' tables are 16 feet by 4 feet. Each table seats 16 people. One line of tables is 6 feet from the sideboard, crosswise of the hall; next is an aisle 4 feet in width; next another row of tables. This, we will say, is the woman's side of the house. Then comes a broad aisle 12 feet wide and the same arrangement exists on the opposite side of the hall. The unit upon which we do all of our serving is 32. Two tables extending crosswise of the hall seating 32 patients constitute one unit. The food for this unit is brought into the dining-room on the food cars, just before the patients enter the hall, in boxes and various utensils, all hot foods being kept in bulk.

In order to illustrate one of the means by which we diminish the handling of foods, I will speak of the method of cooking and serving steamed potatoes. There is a perforated galvanized iron box which will hold sufficient potatoes for 32 people. This holder is put into the vegetable steamer and just before the dinner hour the box is removed from the steamer, the potatoes not being disturbed, and the box is then carried to the sideboard and the only handling of the potato in serving is when it is being placed upon the patient's plate.

For the handling of the butter on the butter chips we have a wire butter rack of four shelves. Each shelf will hold a wire tray upon which we place 20 butter chips, so that the whole rack will accommodate 80 butter chips. This rack has a handle by which it can be easily carried. Before the meal this rack is placed upon a second shelf, which is below the slate shelf sideboard above described. From the wire trays which rest in the butter rack the butter chips, with butter already on them, are distributed to the patients during the meal at the appropriate time. Another utensil is a wire rack holding 16 dessert saucers. This has a handle by which it is easily carried and at the appropriate time the desserts are distributed from this rack to the patients.

The signals for the separate steps which take place during the meal are announced by the playing of a tubular chime, on which the first, third and fifth notes of the scale are sounded.

One principle which is observed strictly is that not a morsel of food is placed upon the tables prior to the patients being seated at the tables. The only articles upon the tables when the patients come to the dining-hall are the cup and saucer and drinking glass.

We come now to a detailed description of a meal, we will say the dinner hour. At 11.25 a. m. the signal is played upon the tubular chimes. This signal is for the orchestra, which then begins to play. As soon as the music begins the patients enter at four different doors and file to their places at the tables. This process takes five minutes. As soon as the last patient is seated and the dining-room is quiet, the music having ceased, the second signal is played. This is a signal for the distributing of the knives, forks and spoons to the patients, the nurse or attendant having previously stationed herself or himself at the sideboard end of the tables of each group of 32 patients. On the signal the nurse distributes to the patients, from the box containing the silver, utensils which are to be used for the meal; placing, for instance, one knife, one fork and one spoon at the right hand of each patient. At the signal for the distribution of the silver the orchestra immediately begins playing and ceases again as soon as the silver is distributed. From this time on throughout the meal the orchestra renders various selections without any further reference to the signals.

We will now take a single group of 32 people and describe the serving of this group, bearing in mind that the same process is being carried out at the same time with every other group of 32 people in the dining-room.

As soon as the silver has been distributed, the signal sounds again. On this announcement the nurse turns to the sideboard, where there have already been placed the meat course or whatever it may be and the vegetables. She uncovers the food boxes and begins placing upon the plates which are already at hand on the sideboard the portion of meat, the potato and the vegetables. At the same time two patients from each group of 32 persons who are appointed as assistants to help the nurse, rise from their places

at the table and taking one plate in each hand distribute them, as fast as the nurse fills the plates, to the group of 32 patients, thus each patient makes eight trips. The two patients then place their own plates at their places at the table and resume their seats and eat their dinner at the same time with the other patients. This operation of serving the meat and vegetable courses occupies five or six minutes. Without any further signals the nurse then goes to the bread tables, which are ranged in the broad center aisle, and distributes six plates of bread, usually with ten slices on each plate, to her group of 32 patients. She then takes a tray from the butter rack and distributes the butter chips, which, as I have already indicated, have had the butter distributed on them some time before the meal begins by the regular employees, who are occupied in the serving room. The nurse then pours into the glasses water from pitchers which are on hand on the sideboard and then leaves two filled pitchers on each table, in order that the patients may further help themselves. Tea is sometimes served at the dinner hour. The nurse in that case passes around, filling the cups from a pitcher. There is always sufficient food, so that in case patients wish for a second helping they can have it.

Up to this point 25 minutes have been consumed from the time the signal was given for the entering of the patients, and it is now 11.40. At this time another signal is played and upon this the attendants and nurses, with the exception of four supervisors and six attendants, go to their own tables in order to eat their dinners. Four tables at the present time are reserved at the end of the dining room nearest the main serving room for employees. The time which these nurses and attendants have for their dinner is 25 minutes and during all this time the supervisors and those nurses and attendants who have been left on the floor are overseeing the patients and attending to their wants.

If a hot dessert is to be served the employees in the main serving room, assisted by certain patients, will have begun at 11.30 to distribute this dessert into the dessert saucers, the dessert saucers being then placed in the dessert rack, above described. All these dessert racks, having been placed upon the food cars, are taken to the dining-room at 11.55 and two racks are placed on the slate sideboard at the end of each group of 32 people. At

12 o'clock a signal sounds and the two patients from each unit of 32, who in the first instance assisted the nurse in distributing the main course, go to the sideboard, each taking one rack and distributing 16 saucers from it to 16 places at the table. This latter process of distributing the saucers occupies usually less than a minute and a half. At 12.15 the signal which sounds is the call for the nurses and attendants, who have been eating their dinners, to return to their places at the patients' tables. As soon as they have all reached their places, the orchestra having ceased playing, another signal is sounded which is the signal for the collecting of the silver. The orchestra during this process begins again playing appropriate music. In the picking up of the silver the patients are trained to place their knives, forks and spoons at their right hand and the attendants are instructed to pick up from the right hand of each patient the same number of utensils which were originally given out. In this way, knives, forks, and spoons are checked up. If anything is found missing the fact is reported at once to the supervisor, who takes the necessary steps to find the missing articles. At 12.20 a signal is played which is the signal for the patients to leave the hall. Each table is dismissed by a supervisor in order and the patients file out in the same manner in which they entered. I should have stated that the patients, in entering and leaving the hall, do not file out in close or in any regular marching order.

I will say a word here about the character and quality of the music which is rendered during the meal. While the patients are entering and leaving the hall it is customary to play marches, during the distribution and collecting of the silver the music is of a lively and forte character. During the remainder of the meal the instructions to the orchestra are that compositions without marked time shall be played and as the meal progresses the instructions are that the music shall gradually become more quiet. The reason for this is that as a meal progresses the sounds which arise from the handling of the plates and the use of the knives and forks by patients gradually diminish. It is desirable at all times not to have the music of an obtrusive character, but that it shall furnish rather the effect of a quiet undertone of musical sounds. I think it is this effect that should be striven for. If music of a lively nature or of a marked time is being played,

I have observed that patients are apt to beat time to the music with their feet or with their knives or forks, while subdued music seems to me to have a tranquilizing effect upon the patients. Usually at the latter portion of our meals, we will say after the desserts have been given out, the hall will be perfectly quiet, as far as any sound occasioned by patients is concerned.

To those who have an acquaintance with musical compositions the following sample program will indicate the sort of music which I think should be rendered during a meal.

PROGRAM FOR THURSDAY NOON—MAY 22, 1913.

1. March, "Prince of India".....Farrand.
2. Distribution of Silver, "Silver Bell".....Wenrich
3. Selection from "Lohengrin".....Wagner
4. Valse.....Chopin
5. Paraphrase, Melody in F.....Rubinstein.
6. Collection of Silver, "Silver Bell".....Wenrich
7. March, "Dallas".....Hall.

In regard to the orchestra, I think that care should be taken that this is not too large. From four to six pieces, aside from the piano, are sufficient.

In regard to the furnishing of entertainments during or immediately after meals, I will say that I have frequently been able to obtain professional singers to sing from the stage during the meal and I have had our hospital choir, consisting of thirty voices, render Christmas carols and music appropriate to other holiday seasons of the year. After a meal has been finished I have on occasions had an entertainment lasting for an hour's time given from the stage. The patients in that case who were seated back to the stage turning their seats toward it. On such an occasion patients who do not eat regularly in the dining-room, as for instance some of the more feeble and certain disturbed patients, are brought to the dining-hall and seated in the broad aisle, and in this way we can furnish entertainment for 1000 or more of our patients at one time.

By the method of serving which I have described efficiency, order and precision are arrived at; the food reaches the patient steaming hot and one hour is given to the dinner meal.

If I have made this description clear I think it will be seen that it is immaterial how many units of patients we have, pro-

vided we have the proper arrangement for the care of each unit. In regard to the size of the unit, I would say that this can be 20-24-28 or 32 within practical limits. If smaller or larger units should be used a disadvantage would arise. In my opinion a group should not be less than 20 because the food will be distributed in too small amounts to retain its heat and the smaller the unit the larger number of units which you will have to have. If the units are larger than 32, the amount of food for the units becomes too bulky to handle properly.

I wish to contrast this picture with one in which the patients enter a hall without surroundings which have been made attractive, where the food has been placed on the tables before the patients enter the dining-hall. In this last instance you will observe for one thing that the patient who is the first to seat himself has finished his meal before the last patient has reached his place.

If you go into most of our hospitals for the insane you will find that the small ward dining-rooms have been rendered attractive by the furnishings and decorations and flowers, but oftentimes, where congregate dining-rooms have been established, I think it has been the case that the asthetic side has been strangely forgotten. I think that the greater part of the mistakes which have been made in conducting large congregate dining-rooms rise through improper methods of serving food.

I think that attention given to the propositions which I have set forth, namely: the making of the large congregate dining-room a therapeutic measure and the adoption of methods of efficiency in the serving of food, will make all the difference between condemnation and approval of the congregate dining-room, on the part of officials, employees and the patients themselves.

SOME SUGGESTIONS REGARDING THE IMPROVEMENT OF THE MEDICAL SERVICE AND THE CARE AND TREATMENT OF THE INSANE.*

By WALTER G. RYON, M.D.,

Medical Inspector for the State Hospital Commission, Albany, N. Y.

Prior to the advent of the newer psychiatry in this country the medical work, in the large number of our public institutions, was more or less of a stereotyped character; the histories were meager in outline, and the scientific work at a low ebb. The hospitals were, in other words, institutions more for custodial care than for scientific purposes.

In the past decade the medical work has made more rapid advances. In a few states psychiatric institutes have been established, affording governing centers for the scientific work of the institutions under their direction. Such institutes should be established in all states. It is only by having such central institutes as these that the medical work can be at all systematized and the most uniform and best scientific results obtained. Here the various physicians of the public hospitals and also of the private sanatoria can be instructed in clinical psychiatry and neuro-pathology and returning to their respective institutions, instruct their colleagues on the staff, thereby increasing the efficiency of all. It would be most fortunate if all the new men entering the medical service of our hospitals could have their first service at such institutes, thereby fitting themselves at once for thorough and scientific work.

The establishment of courses in clinical psychiatry and neuro-pathology, the holding of inter-hospital conferences, the conduction of daily staff meetings and the organization of local psychiatric societies and clinics, have all given an impetus to the work which had not heretofore been attained.

Notwithstanding this, it is still true that, upon the part of some, there exists a tendency to perform the required work in a more or less mechanical and superficial way, with a laxity of purpose that should be corrected.

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

These faults may be met and overcome by the appointment in each hospital of men who will act as directors of clinical psychiatry, the remuneration to be that of a first assistant physician in the larger institutions, while in those of a smaller type the designation of a senior assistant physician would suffice. It should be the duty of these men to supervise and direct the clinical work of the hospital, with the object in view of obtaining the most complete and scientific results. These officers should be selected by the superintendent, with the approval of the directors of the various psychiatric institutes, and of the commissions or boards of control whose duty it is to administer and supervise the institutions for the care of the insane.

These physicians should be held entirely responsible to the superintendent for the proper conduct of the medical and scientific work in their respective institutions. They should conduct the staff meetings, review the clinical work from day to day and see that the highest possible standard of efficiency is maintained. On the other hand, these men should be afforded every advantage possible, by courses at the various psychiatric institutes and elsewhere, and the command of all necessary literature, to not only fit themselves for this work, but to enable them to instruct their associates.

In a similar manner there should be designated in each hospital a senior assistant physician, who should act as the pathologist of the hospital. These men should avail themselves of the advantages of the institute, and keep in touch with the work in progress there, not only in order to learn new methods of technique, but to acquaint the director of the institute with the work in progress in their respective hospitals. The pathologist in addition to performing all of the autopsies at his institution, and subsequently working up the material, should himself prepare the clinical history of the case, which should be presented by him, in conjunction with his autopsy report, at the pathological staff meeting. In this way errors of diagnosis and discrepancies and omissions in the record would be more fully brought out. Possibly no one would enjoy the criticisms that such a method might bring forth, but nevertheless such criticism would result in more careful methods and an increase in efficiency upon the part of the medical staff.

The examination and study of new patients admitted should largely be centered upon the reception services, which should be in charge of senior assistants who have been trained in clinical psychiatry, and arrangements be made so that all will have an opportunity to work with them.

In the enthusiasm developed by the study of the acute mental cases the chronic patients should not be overlooked. Here exists also a great opportunity for study. The physician on a chronic service, who segregates and makes an intensive study of his organic cases, accomplishes quite as much for the cause of science as does the physician working only on an acute receiving service. This fact is often forgotten by those who complain of not being able to work on an acute service.

A closer relationship should exist between the hospital and the surrounding community. In the past it has been the custom of some hospitals to invite the attendance at staff meetings of the general practitioners of the district, sending word to those who are particularly interested in the patients to be presented, either by reason of being one of the medical examiners or the family physician. This practice should be encouraged by all institutions, as it not only enables the hospital to obtain a more complete history of the patient, but enables the medical profession to familiarize themselves with the methods of examination and the standard of care maintained in the public hospitals for the insane.

This relationship can be further augmented by the medical officers themselves by attending the meetings of the various local medical societies, and, by the presentation of cases and the preparation of papers to be read at these meetings, give the medical profession the benefit of their experience and special training.

Another duty evolves itself upon the medical officers of our hospitals and private institutions. Much good work can be done by them along the lines of prevention and mental hygiene. Public meetings, at which the preventable causes of insanity are discussed, should be conducted by them, and every effort made to demonstrate to the public the means of eliminating the preventable causes of mental disease. At such a time, by the exhibition of moving pictures, photographs, various charts, industrial products of the hospital, and demonstrations in practical nursing, the work of our public hospitals can be shown and the general

public enlightened as to the uses and needs of these institutions. Such work would be of lasting benefit, not only to the public, but, from an economic standpoint, to the state as well.

The hospital may further increase its usefulness by the establishment of out-door clinics. Certain hours should be designated, and a day set apart, when the medical staff can be assigned to this work. This would enable those in the community, who so desire, to come to the hospital for advice and treatment, thus affording the hospital to reach many in the incipient stage of their mental or nervous trouble, when most benefit will accrue from treatment. The treating of these cases should be entered into with the family physician, thus encouraging him to look upon the hospital physicians as colleagues to whom he may feel free to turn for advice and guidance. In New York state three such clinics have been established in connection with the state hospitals, and have met with unqualified success.

A closer relationship should be maintained between the commissions, boards of control and the state hospitals on the one hand, and the private licensed institutions on the other. Physicians in charge of these sanitarium and their associates should feel free to attend the inter-hospital conferences, to visit the various psychiatric institutes and the state hospitals, and thus familiarize themselves with the work that is being done. In this way the standard of care in these institutions could be improved, and the medical work put upon a higher scientific plane than now exists. All are interested in the same special work; all hope for the best results, and therefore all should work together for the best standards.

Not only have the medical standards of the hospitals improved during recent years, but there has been an equal advance in the methods of treatment. At the present time practically all of our hospitals and a large number of private sanitarium are fully equipped along hydrotherapeutic lines, and the former harsh methods of restraint by the means of drugs and various kinds of apparatus have, in the main, given way to the use of the hot and cold pack and the continuous bath.

Occupation as a form of treatment has been in vogue for many years, but has been limited chiefly to patients who could employ themselves intelligently in the various industrial departments

of the hospital or about the farm and grounds. It is only within comparatively few years that systematic work has been done in the matter of the reeducation of patients, not only with a view of arresting deterioration, but to improve the habits of those already demented. Along this line much has been accomplished, yet there still remains much to be done.

In many of the hospitals there is but little interest taken in this matter. It is often hard to make the medical staff see the necessity and the great importance of this work. One hears upon all sides the cry "I have not the time to devote to this matter, because of my ever increasing duties." This we will remember was the same complaint that was offered long ago when newer methods in clinical psychiatry were introduced, yet that work has been undertaken successfully. Now this work is so important that all should undertake it. In each state hospital and private licensed institution there should be employed competent teachers for this work, to instruct not only kindergarten methods for the more deteriorated, but basketry, raffia work, embroidery, flower-making, arts and crafts, etc., for those who can undertake the same. In addition to these, patients should be instructed in calisthenics, gymnastic exercises, folk dancing and games of various nature, thereby improving sluggish bodily functions as well as stimulating sluggish mental processes.

Such instruction should preferably be given upon the wards of a hospital, rather than in one central place, in order to attract the attention of idle patients, and stimulate them to take part. The keynote of success in this work is individual attention, and if carried out systematically will eventually free our wards of the undesirable untidy class, brighten the environment and stimulate the interest of the more chronic cases, and hasten the recovery and discharge of the recoverable patients.

It would seem amiss, if, before concluding this paper, no mention were made of the care of the insane pending commitment. In the majority of the states the insane pending commitment are looked after by the poor authorities, either in almshouses, jails or at home. In recent years New York state has enacted a statute which compels the health officers of the state, outside of the county of Albany and the City of New York, to maintain the insane pending commitment in a safe and comfortable place, and to provide them with proper nursing and attention, the expense

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incurred being a charge upon the county. This is a step in the right direction, but even with this precaution during the fiscal year ending September 30, 1912, two hundred and twenty patients were admitted directly to the state hospitals from jails and lock-ups, and in many instances, as shown by the hospital reports, patients were found in hospitals, sanitariums and at home in various forms of restraint and in deplorable conditions.

It is indeed fitting that a medical officer should have the oversight of this important matter, but there should also be in each state an arrangement whereby each county should provide and be required to maintain, preferably in connection with a general hospital, a suitable pavilion for the detention, care and treatment of the insane pending commitment. These pavilions should be subject to the visitation and inspection of the commissions or boards of control governing the care of the insane in the various states, or their representatives, and should be governed by rules and regulations formulated by them.

The nurses employed at such pavilions should only be those who have had experience with the committed insane, and the supervising nurse should preferably be a graduate of a state hospital training school. Should such a pavilion be large enough to require the services of a resident physician, he should be one who has had at least three years' experience in a state hospital for the insane.

Meetings of such resident officers and the health officers should be held at the various hospitals within the state, where they would have the benefit of observing the modern methods of the care of the insane, and where they could witness practical demonstrations in the handling of violent patients, forcible feeding, and hydrotherapeutic measures.

Such a scheme may strike many of you as being of a Utopian character, but it is at least practical and could be promulgated by the proper legislation. Let us therefore all unite our efforts to further this end, that existing conditions may be improved and that places be provided throughout our states where not only incipient cases of insanity may receive early and beneficial treatment, thus in many instances avoiding hospital care, but that the insane awaiting formal commitment may receive the care so necessary to prevent an aggravation of their existing mental trouble.

DISCUSSION OF PAPER BY DR. MAY.

DR. HENRY M. HURD.—I am sorry Dr. May did not finish reading his paper, because I hoped he was going to present some systematic method by which we could utilize these statistics. Of course, figures cannot be carried into practice. Patients are classified in many instances according to the individual preference of the man who happens to be reading the statistics. I am sorry to say that the American people are an imitative people. When in some leading institutions certain forms of disease are discovered immediately every institution throughout the country discovers the same disease; when another light appears in two or three years and makes a specialty of another form of disease, in a short season we have a crop of the new form. I remember when paranoia was first heard of we had all sorts of statistics about it and many supposed recoveries. Now other forms of disease take the place of this and we continue to wander along in similar uncertain ways. I do not think that it is possible for us to have a uniform classification of patients so that we may compare one institution with another or one state with another. Perhaps I ought to add, for the comfort of members of this Association, that our statistics are not worse than those of other allied institutions. Last winter I had occasion to talk with a prominent statistician about general hospital statistics, and I learned from him that only one hospital in the United States published statistics of the slightest value. I am inclined to think that until we acquire more knowledge and have a better conception of the disorders and conditions which we are comparing we are likely to continue to wander in the dark. I wish it were possible to secure a combined analysis of the insanity statistics of the whole United States. Within the last year I have been working industriously over them with confusing results. I am not prepared to make any recommendation at the present time as to the mode of dealing with them, but I call your attention to the fact that we are wandering aimlessly in the wilderness at the present time.

DR. SALMON.—The National Committee for Mental Hygiene has been carefully studying the reports of the institutions in different parts of the United States. Some of the methods employed in recording statistics are so inaccurate that it is impossible to tell the number of patients under treatment in the institutions in this country at a given time. An instance is the matter of reporting patients on parole. In some hospitals those patients are reported in the discharges and in others they are counted as present at the end of the fiscal year; so it is hard to tell which are discharged and which are paroled. In other reports there is no means of telling in what class paroled patients are carried. This is a simple matter, and we may look for still wider differences in clinical classifications and in

reporting admissions and readmissions. I think that there should be a uniform system of classification of at least the main facts. I think that a committee of this Association or of the National Committee for Mental Hygiene, or a committee representing both organizations, should be appointed to make a careful study of the matter and submit recommendations to this Association. It is impossible for us to look to the Census Bureau for any assistance, as the statistics it collects are compiled only once in ten years. It would be a very great help if we could only get a little better system of reporting the movement of population than we have at present. Better methods of reporting the psychoses treated, financial statements, etc., would follow.

DR. MACDONALD.—I regret that Dr. May was not permitted to extend the time limit a trifle and finish his interesting paper. During my experience as a member of the State Commission in Lunacy, and subsequently, I have had occasion to give not a little attention to the subject of statistics of the insane, and as a result of my study of the subject I have been forced to the conclusion that the statistics of institutions for the insane are unreliable and of little value. My conclusion is based on the fact that medical officers of hospitals for the insane differ widely on the questions of recovery, etiology, diagnosis as to forms, etc. For instance, one superintendent will regard a patient as recovered, while another will class him simply as improved. Also as regards the causes of insanity, we know as a matter of fact that one seldom finds a case that may be attributed to a single cause; in other words, there is substantially in every case a combination of causes, any one of which might be insufficient in itself to produce insanity, but, acting in conjunction with other causes, may be of very great importance. One observer will naturally attach more importance to one cause, whereas another may ignore that altogether and decide that the case is due to a different cause. For instance, if we take a case in which alcohol plays a prominent part, this may be put down as due entirely to alcohol, whereas a careful investigation of the history of the case may show that there are other conditions, such as syphilis, general ill health, mental worry, strain, etc., any or all of which may have contributed to produce the result. Again, many observers entertain widely different opinions as to the importance of heredity as compared with the importance of so-called exciting causes. For my own part, I have come to attach more and more importance to heredity and other predisposing causes, and less and less to exciting or immediate causes of mental disease. As a matter of fact, we rarely find an individual who has not at some period of his life been exposed more or less to so-called exciting causes without suffering a mental break-down. It is only when these so-called causes are superimposed upon a bad heredity or other predisposing causes that they become operative in an etiological sense. For the reasons I have stated I regard the statistics of hospitals for the insane upon these questions as of little or no value.

DISCUSSION OF PAPERS BY
DRS. BRIGGS, GOSS, RYON AND HARRINGTON.

DR. MACDONALD.—I would like to ask Dr. Harrington if provision is made for the presence of a medical officer during the meal time in the dining-room?

DR. HARRINGTON.—There is no medical officer required to be present at each meal; I leave it to my medical officers largely; they visit the dining-room frequently, and report is made to the medical officers of everything that occurs in the dining-room; that is, if the patients are in any way unruly, or in case any of the patients do not eat.

DR. BURGESS.—I want to thank Dr. Harrington for his interesting paper. At the same time I am absolutely opposed to congregate dining-rooms. I admit they are more economical, and perhaps may be of great value, but I would like to ask Dr. Harrington how does he segregate his patients in the congregate dining-room? Twenty-five years ago Dr. D. Hack Tuke, a great alienist, was very strong on congregate dining-rooms. I told him I thought they were absolute cruelty. I admit the economy, but claim that what I told Dr. Tuke is correct. I have had patients time and again beg of me, "For God's sake, don't send me to that congregate dining-room." How are you going to classify your patients in such rooms? There are certain patients who are ladies and gentlemen, even though public charges, and if they are seated opposite a man or woman who is not a lady or a gentleman; one who will jab his hands into his food and cram it into his mouth, while they will eat properly, how are these patients going to enjoy their meals? Personally I do not enjoy being seated beside a man who does not eat properly. How are you going to prevent a gentleman or a lady being placed opposite a man or woman who has no idea of proper table behavior? If Dr. Harrington will solve that point I will agree with him.

DR. EYMAN.—The patients are segregated in congregate dining-rooms the same as they are in the ward dining-rooms. There is no difficulty in placing the ladies and gentlemen by themselves and the riffraff by themselves in the congregate dining-room the same as in the ward dining-room. If a patient sticks his hand into the food it is the place of the nurse or supervisor to watch him, and if that patient is not fit for the congregae dining-room he is sent somewhere else. For twenty-nine years I have had to do with congregate dining-rooms. Twenty-five years ago I helped open a congregate dining-room at Toledo, O. Of course, there are disturbances during a meal, but there are many times disturbances in the ward dining-rooms. The thing that bothered me more than anything else in the ward dining-room system was the constant reports that the patients did not get enough food. In our institution at Massillon we have present at every meal a medical officer; also, there is a supervisor present at every meal in addition to the nurses. I think the service of meals can be made much more

satisfactory in the congregate dining-rooms than in the ward dining-rooms; the food can be served hotter and better. The supervision is much better; a patient who does not eat his food can be coaxed into eating by the medical officer, for there is always one present during the three meals. I often go into the dining-room; when there is a patient who is not eating I will place my arm around him and ask him if he is not going to eat and he will often readily acquiesce. I am a very great advocate of that system.

DR. BURGESS.—Why not make your hospital system one ward and turn all your patients loose into that ward, irrespective of class? If you are going to classify them according to their mental condition, why not classify them in your dining-room? I cannot see where the difference comes in.

DR. GILLIAM.—I am very much of the same view as Dr. Eyman. I cannot see myself why a person eating on the ward should refrain from sticking his hands into the food any more than in the congregate dining-room. I have a congregate dining-room that seats 1,000 people, and it is very rare that we have any trouble whatever. We require a physician to be present at every meal, in addition to the supervisors, both male and female, so there is constant supervision at all times to see to the proper behavior of the patients and that the attendants properly perform their duties in taking care of the dining-room in addition to enforcing discipline. Marching back and forth to the dining-room also gives exercise to the patients during the bad season of the year when it is impossible to go outside, which is very important. We have our patients classified and only those go in the dining-hall who we know will conduct themselves properly. When there is a patient who will not conduct himself properly he is sent to the dining-room on the wards. The patients fed on the wards are those who are not in condition to feed themselves properly in the congregate dining-room, or are unable to go on account of physical infirmity.

DR. E. H. HOWARD.—I would like to protest against the nurses eating at the same time that the patients do, in the same dining-room. This I am sure is an improper arrangement, both for the good of the patients and the nurses. A little more time taken for the meals would allow the nurses to have their meals by themselves, separately, and allow them to have more time to serve the patients more perfectly during their meal.

DR. GILLIAM.—The nurses and attendants do have their meals separately in our hospital.

DR. WOODSON.—While I like machinery and admire the working of it, I am opposed to having in the dining-room everything go by the clock. One patient may require ten minutes to eat, while another may require twenty, thirty, or even forty minutes. Patients suffering from agitated melancholia, from epilepsy, or the badly disturbed and untidy patients, or the manic-depressive forms, should not all be gathered in one dining-room. The chief characteristic of some of these forms of insanity is hesitation; they do not know whether to eat this or that, or whether to eat at all or

not. To my mind it is not best to have this regularity of passing dishes; one patient may be waiting, while another patient will not have eaten enough. I believe if men or women are unfortunate enough to become insane they are entitled to anything they want and they should be provided with what they want and when they want it. They regard me as a crank in the state of Missouri on this question. In the institution over which I preside we never put all the patients in the same dining-room—I do not believe it is home-like. I would rather sit at a table in the dining-room at a convention like this, with half a dozen congenial friends with me, than to attend a banquet where there were five hundred people, and I know I enjoy my meal better. I am a good eater and I believe I can establish that fact, but I want to eat quickly and get out, and if my associate wants to take more time I believe he should be allowed to do so.

THE PRESIDENT.—This eating question is always an interesting one to most of us, but do not let us take up too much time, for we have three other papers that have been read and are before you for discussion.

DR. FRENCH.—I was in hopes that Dr. Briggs in his plans for redistricting the Massachusetts institutions would advise the abolishment of classification of acute and chronic insane and make the institutions for the chronic insane receiving hospitals. I have had considerable experience in institutions of different classes and one of my strong objections to the plan of congregating the chronic insane together is that it destroys hope in the patients and also in their friends. A patient very soon translates the term "chronic" into incurable, and if he is a manic-depressive case he reasons that he has been transferred to an institution for incurables; therefore, there is no hope for him, and I know of several suicides that have resulted directly from that loss of hope; I believe it was because they were in institutions for incurables.

DR. STEDMAN.—I would simply like to emphasize a detail of the work at the Taunton State Hospital in the employment of patients there, and that is, how much advantage is gained from abandoning the sewing-room and having the work done entirely on the wards. As Dr. Ryon suggested, it stimulates the other patients to take part, who, before that time, would not have been selected to go into the sewing-room; it stimulates a large number of patients to take up the work on the wards, and we have adopted this plan.

In regard to Dr. Ryon's excellent paper, there is one other point I would like to mention, which he has touched upon, and that is the use of the institutions for instruction in psychiatry for the local practitioner. I do not mean simply inviting them to conferences, but to systematically hold the local district society meeting once a year at the state hospital. I know this is done spasmodically, but it has never, to my knowledge, been done systematically; if it could be done once a year, as we are trying to do at Taunton, it would be very advantageous. Not long ago we had a meeting which was largely attended by the local practitioners and the medical officers of the hospital. One of the trustees read a paper; cases were

demonstrated to the physicians and they were very much interested and so much pleased that they voted to have the paper printed and the demonstrations also printed for circulation among the members of the society. There is a hospital in Indiana that does splendid work in that line, but I do not remember what one it is; if the superintendent is present I wish he would enlighten us on this point.

DR. BRIGGS.—In redistricting the state institutions the plan would include doing away with the hospitals for the chronic insane; that will be done automatically. Each hospital group should have wards or buildings for acute, chronic, and I would go still further and say, for criminal insane. I think it is demoralizing to have a large criminal insane hospital; it is a most discouraging institution to handle. If the plan for redistricting was carried out there would be a small colony connected with each institution. We would have in each ward one type of mental disease, and men on the staff would specialize more; I would have one part of the institution for cases of dementia præcox; another part of the institution would take another form of insanity, and so on.

I would like to ask Dr. Goss in regard to the number of hours of employment of patients in the hospital. The statistics as made up at present convey no idea of the actual employment of patients.

DR. GOSS.—I have no statistics in regard to the number of hours, but I will say in a general way that patients working in the shops, the number of which I gave in my paper, unless they have parole, work half a day, which is from two and one-half to four hours; if they have parole morning and afternoon before and after their work is done they work from seven and one-half to eight hours—those working on the farm about eight hours; on the wards it is rather difficult to get the exact number of hours, as they work more or less all of the time after the meals are out of the way, and some patients work more steadily than others.

DR. MELLUS.—I do not know, but some of you may have a misunderstanding about Massachusetts. It is only fair to state that we have a state hospital for insane criminals, and another for epileptics; we also have two schools for feeble-minded, and we are paying special attention to such classification of our cases as is possible at the present time.

DR. STEDMAN.—Dr. Briggs, in closing the discussion on his paper, has alluded to the lack of separate provision for the female criminal insane in Massachusetts, and I wish to say that five or six years ago that matter was taken up by a committee of the Boston Society of Psychiatry and Neurology and thoroughly investigated. It was found that the female criminals in our hospitals for the insane presented no difficulties as to their care, except in one or two cases, and were comparatively few in number. It seemed, therefore, to be at that time an extravagant and unnecessary expenditure to construct a separate building for the female criminal insane, or an extension of our asylum for male insane criminals for that purpose, and the plan was abandoned.

Notes and Comment.

RESIGNATION OF DR. URQUHART.—The resignation of a distinguished superintendent is announced from Scotland. Dr. A. R. Urquhart, physician-in-chief of James Murray's Royal Asylum, Perth, retires after a service to that institution of thirty-four years. Few British psychiatrists are so well known in this country, since our colleague has wrought zealously both as scientist and administrator and made his influence felt on both sides of the Atlantic.

Dr. Urquhart graduated with honors from the University of Aberdeen in 1873. His career in mental medicine began as assistant medical officer at Murthly Asylum, Scotland, about forty years ago. Later he saw active and varied service in mental hospitals in England. In 1879 he was called to the superintendency of James Murray's Royal Asylum. For many years Dr. Urquhart was one of the editors of the *Journal of Mental Science*, a rôle in which he did work of high order and greatly extended his reputation. Not only has he raised the Murray to a position of enviable eminence among institutions of its kind, but in the long years of his residence in Perth he has taken a leading part in public affairs and endeared himself to town and county by a life of peculiar civic richness. In the British Medico-Psychological Association Dr. Urquhart has exerted conspicuous influence, his penetrating mind and sturdy common sense having always been a tower of strength in the councils of that society. He is a Fellow of the Royal College of Physicians of Edinburgh and has been an honorary member of the American Medico-Psychological Association for many years.

We regret to learn that impaired health has compelled our *confrère's* retirement from active work. This JOURNAL bespeaks for him "an age of ease" with "all his prospects brightening to the last." That he has richly earned as the reward of his long and faithful labor.

It is reported that Dr. Urquhart has retired on a pension equal to two-thirds of his salary.

GOVERNOR DUNNE AND THE ILLINOIS STATE HOSPITALS.—A few years ago a State Board of Administration was created in Illinois to manage the state charitable institutions and the first steps were taken, followed in turn by others, to standardize the work of the institutions generally, and in the hospitals for the insane to develop and encourage a scientific spirit in the medical work, and attract to the service physicians who could and would give the best care to the wards of the state.

To this end all positions below that of medical superintendent were placed under civil service regulations. Appointments to these positions were made upon competitive examinations and promotions among assistant physicians were determined in the same manner. Why the position of medical superintendent was left out of the classified list we have not learned and it certainly would appear to have been an unfortunate error. We now learn that Governor Edward F. Dunne has asked for the resignations of the members of the State Board of Administration, of Dr. Frank P. Norbury, alienist to the board, and that the resignations of all but three of the Superintendents of State Institutions have been received and accepted.

In four instances where new appointments have been made by the Governor, the appointees have, we are informed, had no previous hospital experience. The Governor appears to have been so anxious to put his own men into office that he has usurped the powers of the State Board of Administration which body is supposed, under the law by which it was created, to make the appointments and has named men to the board to be confirmed by its action.

No more glaring example of the evils of the spoils system in politics has been brought to our attention. The Governor of Illinois socially and in his business and private relations is probably an estimable gentleman, and nothing save their lack of experience in the work which they have undertaken can probably be alleged against his appointees—but we feel that the right thinking constituents of the Governor, those who regard the insane and defective as the wards of the state, entitled to the best care which the medical and charitable standards of the day recognize, will call him to strict account for his acts.

If there were any reasons requiring this wholesale change in administrative heads of state institutions, and the manner in which these changes were made clearly indicates the purpose to have been rather to reward political service, than the good of the service, surely there were to be found among the assistant physicians, men who by reason of experience and training would far better fill the vacancies than men of no previous experience or training.

Were the Governor the managing director in a private corporation we do not for a moment think he would dare face his fellow directors with a proposition to turn out tried and experienced officials from positions of great responsibility and substitute for them men whose sole claim for consideration rested upon affiliation with the dominant political party.

MEETING OF THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION.—The seventieth annual meeting of the American Medico-Psychological Association will be held in Baltimore May 26-29, 1914.

The committee appointed to arrange for the Baltimore meeting is already taking active steps to prepare for the comfort and entertainment of those who shall attend the meeting, and in conjunction with the programme committee hopes to make the session a memorable one. The JOURNAL for January will, it is hoped, be able to present some preliminary statements of progress made in general arrangements and programme

Book Reviews.

The Influence of Monarchs. Steps in a New Science of History. By
FREDERICK ADAMS WOODS, M. D., pp. xiii, 422. (New York: The Mac-
millan Company, 1913.)

In this work the author of *Mental and Moral Heredity in Royalty* aims to apply his methods of historical measurement or "historiometry"—a term which he first proposed in 1909—to questions of national growth and decline, and to trace the influence of monarchs upon the countries over which they have ruled. To this end he has selected 14 European countries and presented a brief outline of the successive alterations in their material conditions, in comparison with the varying mental and moral characteristics of their respective rulers. A study of 368 successive reigns or periods, beginning from the tenth to the sixteenth centuries and extending to the French Revolution, leads Dr. Woods to the conclusion that "only very rarely has a nation progressed in its material and economic aspects, save under the leadership of a strong sovereign." Grading the monarchs as +, ±, and —, and the respective reigns or periods likewise, he finds, from a tabulation of 354 cases that, out of 143 strong monarchs, 105 have been associated with flourishing conditions, 27 with nondescript, and only 11 with bad; that out of 76 classed as mediocre, 26 had prosperous reigns, 31 had such as corresponded to their abilities, while 19 reigned during adverse conditions; and, finally, that of 135 weak monarchs, 30 had fortunate reigns, 18 had such as were neither good nor bad, and 87 had such as their defective attainments warranted.

The proportion of coincidences is striking. Certainly, too, one might expect that in the days of absolute monarchies a country would be better off under a strong than under a weak ruler. How far and how exactly the correspondence can be measured is another question. The orthodox historians, particularly those who are primarily investigators, will be inclined to look askance at the author's results from the fact that his information has been derived mainly from encyclopædias and general histories than from sources, biographies, and exhaustive treatises upon special periods. Dr. Woods, anticipating this criticism, has sought to meet it. He states frankly that in covering such an extensive period and in collecting a sufficient number of instances to prove his point he was precluded by the very magnitude of the task from entering upon first-hand or even detailed studies. Indeed, he might well shrink from such an undertaking. But he dares to go even further and to contend that the characterizations and surveys which he finds in tabloid form are not only sufficiently accurate for his purpose; but, from the birds-eye views over wide areas which they furnish, are even preferable to the works so full of matter that the

wood cannot be seen for the trees. Yet, even granting that the encyclopædias and standard histories are approximately correct in their general outlines, the unanswerable objection remains that such accounts are too meagre, too scanty to present all the necessary factors in the problem. For example, Dr. Woods admits that in modern England the influence of the sovereign has been practically negligible and explains this on the ground that the power of monarchy has been superseded by ministerial rule. That is evident enough; but often in earlier times work was done by ministers for which their master got the credit. For instance, *The Defense of the Seven Sacraments*, from which the English sovereigns got their title of "Defender of the Faith," while attributed to Henry VIII, is by no means certainly all his work, and it is notorious that at royal hunting parties skilful game-keepers fire simultaneously with the king to save his reputation as a marksman. So, if Dr. Woods knew more about the environment of the monarchs whose cases he has cited, he might find that their achievements were due to the merits and industry of others. Furthermore, results are often due to circumstances quite independent of the efforts of any single man or group of men. Sir Robert Peel repealed the corn laws and Great Britain at once entered upon an era of amazing prosperity. Free trade contributed substantially to the result, no doubt, but other factors were equally potent—the adjustment of labor to new conditions in the manufacturing world and the widening markets and increased production due to the astonishing development of steam and electricity, to mention only a few.

Just because a man is described as strong and his reign as flourishing does not enable us, upon superficial evidence, to declare that the latter has been due to the former. Still more difficult is the problem of measuring the influence of personalities upon events. The author's method of measuring men's importance by the amount of space devoted to them and by the number of adjectives of praise or blame applied to them in standard works of reference is too naïve to merit serious discussion. It is only by an exhaustive study of a man's acts that one can hope to arrive at anything like a correct estimate of his place in history. Themistocles, for example, has apparently suffered grievously from characterizations resting on a shaky basis of fact. About one half of the book—the clear but dry and monotonous historical summary of the 14 countries selected for illustration (pp. 37-239)—is superfluous. The material in the appendix (pp. 205-403) where the monarchs are briefly characterized in one column, and the conditions of their respective reigns are succinctly set forth in another, would have served the author's purpose just as well. Dr. Woods has shown himself to be commendably painstaking and honest-minded, and has accomplished somewhat by re-emphasizing the personal factor in history—too often minimized unduly in these days—but, in the opinion of the reviewer, he fails decidedly in his effort to present us with a new science of history.

A. L. C.

Outlines of Psychiatry. By WILLIAM A. WHITE, M.D. Fourth Edition. Revised and Enlarged. (New York: The Journal of Mental and Nervous Disease Publishing Co., 1913.)

Previous editions of this work have been reviewed in the JOURNAL, and the fact that four editions have been called for sustains the favorable notice made of the first. The changes made have been, as the author states, mainly in the way of elaboration, and this has been mainly in the description of the psychoses. Illustrative extracts from case histories have been introduced where they would serve to aid the reader in forming a correct idea of a given psychosis.

Involuntional melancholia is still described in a separate chapter, although the author says, as in the third edition, that we have been coming to the belief that the differences between the depression of the two periods of life (he might, we believe, have well said different periods of life) are after all not fundamental, but to an extent at least dependent upon conditions incident to and dependent upon age.

On page ten the author well says: "From the standpoint of disordered function, a psychosis is then the expression on the part of the individual of his *type of reaction* to the conditions of his environment." The type of reaction which is expected from a man of twenty-five is quite different from that which one would anticipate in a man of sixty and is not involuntional melancholia so-called, after all not the same thing as the depressive phase of manic-depressive insanity, modified in the type, by conditions "incident to and dependent upon age."

A partial rearrangement of chapters places the chapter upon Principles and Methods of Examination and one giving a standard for a Minimum Mental Examination at the end of the volume, and these are followed by a new chapter descriptive of the Binet-Simon Tests.

Mind and Its Disorders. A Text-Book for Students and Practitioners. By W. H. B. STODDARD, M.D., F. R. C. P., Resident Physician and Medical Superintendent Bethlem Royal Hospital, etc. Second Edition, with Illustrations. (Philadelphia: P. Blakiston's Son & Co., 1912.)

The author says in the preface to the first edition that the "work has been prepared with the object of providing the student with a succinct account of our existing knowledge of mental diseases. My endeavor has been to induce the reader to think neurologically of mental processes."

The work is divided into three sections. The first deals with normal psychology. An attempt is made to correlate mental processes with their physical substrata in the nervous system, the transcendental psychology of the schoolmen being ignored as useless. In the second section the psychology of the insane is treated in a similar manner. The third section, which treats of mental diseases, follows in the main the classification of Kraepelin, the nomenclature being modified in certain instances when it has appeared confusing to students.

In the present edition some alteration has been necessitated in almost every chapter, and two chapters upon psycho-analytic methods have been added to the second section. In part three a rearrangement has been made to more clearly show the similarity of the toxic psychoses.

It would be interesting to follow in detail the teachings of this author; suffice it, however, to say that in the main they are sound and in accordance with what appears to be thus far established.

It is refreshing to find that he breaks away from some of the established teachings of British medico-psychology, and takes advantage of the results of observations of continental methods. For acute cases rest in bed and forced nutrition takes the place of a system which he says shocked him in his early days when he saw "wan and emaciated patients in a state of acute excitement . . . dancing round the gardens of institutions for the insane."

In securing rest and freedom from motor excitement prolonged baths are prescribed if other measures fail. We doubt very much whether American psychiatrists will easily be induced to try the following treatment for acute delirious mania: "Chloroform is our sheet-anchor in this condition. The patient is anæsthetized and the rectum cleared either digitally or by means of an enema. His temperature is taken, he is washed with warm water and soap and changed into comfortable clothing. While he is deeply under the anæsthetic a tube is passed into the stomach, which is washed out with a dilute solution of carbonate of soda, followed by warm water. A feed is then administered consisting of one pint of milk, two ounces of cream, two ounces of white mixture and forty grains of sulphonal. The patient is made comfortable in bed and the anæsthetic continued carefully for another hour. . . . The sleep continues for many hours; he wakes up refreshed and makes a fairly rapid recovery."

Dr. Stoddard appears to be a strong believer in the efficiency and value of hypnotics, and prescribes them to an extent which would be considered remarkable in the best hospitals in this country, where the rest-in-bed treatment is as thoroughly carried out as by Dr. Stoddard, but where the use of hypnotics is steadily decreasing. He says, page 465, "of all the drugs employed in the treatment of mental disorders hypnotics are the most frequently used." We do not think this is true, certainly not in those institutions on this side the Atlantic with which we are acquainted. With a boldness in the use of hypnotics and anæsthetics which is striking, if not praiseworthy, the author is not fertile in other methods and sometimes appears not to know practically of their uses. For example, he speaks of the wet pack as "a procedure to be employed only with the most extreme caution and circumspection, since it is rather exhausting and tends to raise the patient's temperature. It is used to subdue excitement of such a violent character as is likely to prove dangerous, but should not be resorted to unless he is in fairly good physical condition. It consists in wrapping him in a sheet wrung out of *water as hot as can be borne and outside this in a dry blanket*. He remains in this sort of general fomentation for about 20 minutes or half an hour, during which time it is well to keep up a supply of cold applications to the head."

The author, in discussing the treatment of melancholia, protests against the "regrettably common notion" that the patient needs to be roused out of his condition. He says: "At the present time the watchword of the older neurologists is 'travel,' that of the younger neurologists 'distraction'; the result is the same in both cases, for the patient is sent sight-seeing, perhaps all round the world."

The reviewer more than a quarter of a century ago called attention to this same tendency among physicians on this side the ocean, and regrets that in a measure the same evil tendency exists. We do not think that in the revival in American institutions of industrial and diversional occupation the condition of the patient is lost sight of, as seems to be the fear of Dr. Stoddard as regards British institutions. The bed-and-rest treatment is employed here in our best hospitals as fully as necessary and work and recreation only made part of treatment when the patient's condition warrants.

Dr. Stoddard has in his second edition produced a very excellent book; its faults are few and of such a character as not to mislead the experienced. If a third edition follows we would suggest the omission in the American edition of the chapters on English lunacy laws and forms.

Psychological Medicine. A Manual of Mental Diseases for Practitioners and Students. By MAURICE CRAIG, M. A., M. D. (Cantab.), F. R. C. P. (Lond.), Physician for and Lecturer in Psychological Medicine, Guy's Hospital. (Philadelphia: P. Blakiston's Son & Co., 1912.)

The first edition of this work appeared seven years ago; since then many advances have been made in psychiatry; much has been added to our knowledge of insanity and the etiology and treatment of mental disorders.

Dr. Craig has touched upon some of these, but there are many which have received but scant attention or none at all. The work is essentially of British origin and worked out upon British ideas and takes little notice (and when notice is taken there is not always a full comprehension apparent) of continental ideas and teaching. He still speaks of mania and melancholia as distinct conditions, grouping all forms of depression under melancholia, no distinction being made between the depressive attacks of early and middle life and those of later years—involutional melancholia of Kraepelin. Depression of early life, he says, usually disappears after six or eight months, but only to recur in a few months or years. In his description of the various forms of mania, of which he names five—simple mania, acute mania, recurrent mania, chronic mania and acute delirious mania—he calls recurrent mania the periodic or recurrent form or the mixed variety of Kraepelin's maniacal-depressive insanity.

The chapter on dementia præcox, as well as the references to the subject in other parts of the book, is disappointing. One is surprised at this period of medical history to read that in mental disorders associated with the puerperal period, septic conditions *probably* (*italics our own*) play a part in a certain percentage of cases. Since the introduction of aseptic and anti-septic methods in obstetrics the number of cases of insanity following de-

livery has fallen off to a remarkable degree and in a large proportion of cases now observed the reviewer believes a septic condition can be determined as at least the exciting cause.

In the discussion of paretic dementia the teachings of Ford Robertson are followed as to pathology, and the plates which have been introduced are excellent and well illustrate some phases of the pathology of the disease. Lumbar puncture is suggested for diagnostic purposes, but the method of examining the fluid is altogether too long and complicated, and where the puncture is used as a routine practice its use would be practically impossible.

An interesting and valuable chapter on treatment closes the work. The book has many things to commend it to one who wishes to know the views of different authors, but it is not the kind of work one would place in the hands of a student who wished to have an exposition of the present views upon psychological medicine.

A Clinical Manual of Mental Diseases. By FRANCIS X. DERCUM, M. D., PH. D., Professor of Nervous and Mental Diseases, Jefferson Medical College, Philadelphia, etc. (Philadelphia and London: W. B. Saunders Company, 1913.)

Dr. Dercum approaches his subject from a clinical point of view, which he says seems to be a pressing need, but in doing so has in some measure lost sight of the fact that the clinical point of view is one which takes into consideration all the facts observed at the bed-side, and that the true clinician cannot afford to ignore any of the components of the clinical picture, whether they be somatic or psychic. He calls attention to the fact that it took our ancestors a long time to learn that the insane man is a sick man. Of this fact history presents too many painful evidences. The acceptance of this fact, however, with the constant reiteration that all mental disturbance was based upon some physical cause, resulted, as the enthusiastic acceptance of some recent teaching in psychiatry is in danger of resulting, in certain important features in the etiology and course of many of the psychoses being ignored or forgotten.

Now we are again recognizing the psychic factor in etiology, and while not all psychiatrists are willing to go to the length which some would ask, many see in the psycho-genetic theories of etiology much that a more materialistic conception, if it may be called such, did not explain.

Dr. Dercum has sought to produce a work which will be of use to the general practitioner, and he has succeeded in his self-appointed task. The readers for whom the work has been prepared do not care for elaborate classifications with numerous divisions and subdivisions, and the author has wisely adopted one of extreme simplicity and has grouped under its few heads his clinical descriptions. He groups mental affections under five heads: I. Delirium, Confusion, Stupor. II. Melancholia, Mania, Circular Insanity (Melancholia-Mania, Manic-Depressive Insanity). III. The Heboid-Paranoid Group (Dementia Præcox, Paranoia). IV. The Neurasthenic-Neuropathic Insanities (Psychasthenias). V. The Dementias.

The reader who is searching after light upon dementia, it will be seen in this grouping, will be led into some confusion by finding dementia præcox in group three, and other dementias in group five, and parietic dementia in none of the groupings but considered in another section of the work under clinical forms related to somatic affections.

In dealing with group five, the dementias, the author says "all of the other mental affections thus far studied present symptoms which imply change in the manner of thinking, acting and feeling, *i. e.*, changes in quality of mental action; in dementia we deal with changes in the quantity of mind." It would seem more in accordance with observed facts to say we are dealing, to use Dr. Dercum's own words, with changes in both quality and quantity. Mental enfeeblement surely implies more a change of quality in its early stages than one of quantity. But such criticism is of little import. Why, however, not include dementia præcox, which certainly would come under the test of a change of quantity, and paresis under the dementias; and are not arterio-sclerotic and senile changes sufficiently marked somatic affections to warrant placing the resulting dementias along with the mental diseases related to somatic affections? About a page is devoted to mental symptoms associated with arterio-sclerosis—too little space, it seems to us, to permit an adequate consideration of a somewhat important group of cases.

What we have thus far said but illustrates the great difficulties met in any attempt at classification or grouping of forms of mental disturbance. However we may differ from the arrangement, the description of cases suffices for the purposes. The clearness of characterization might have been increased by the introduction of a few carefully worked out clinical histories, but only at the expense of enlarging the work. Dr. Dercum, with others with whom we have had occasion to differ, speaks of recovery in dementia præcox with impairment. He says: "In other words, a case of dementia præcox may recover, but the recovery, as already stated, is rarely complete. . . . Mental impairment is ordinarily left in a recognizable degree; quite commonly this impairment is decided, so that a partial or incomplete recovery results."

We have no criticism to offer as to Dr. Dercum's statement of facts, but we do not believe that the term "recovery" should be used where there is impairment, and an "incomplete recovery" means to us a patient who is not well—one therefore who is *not* recovered.

The treatment advised is generally excellent, though we notice a tendency to rely somewhat too definitely upon hypnotics. The work was published too early in the year to take into account the intra-spinal injection of serum from parietic patients who had been given salvarsan, but we think more stress should have been laid upon lumbar puncture in diagnosing paresis, always to be used in doubtful cases, and in many hospitals in use in all cases as a routine method of confirming other clinical evidences.

Part III of the book contains a chapter on the psychologic interpretation of symptoms, in which the theories and methods of Freud and his followers are explained.

Half-Yearly Summary.

CALIFORNIA.—The Napa and Stockton State Hospitals have been so overcrowded that recently 200 patients were removed from them to the Agnew State Hospital. A site of 300 acres is being sought in Southern California for a new hospital.

COLORADO.—*Woodcroft, Pueblo.*—This hospital has equipped a school for diversional occupation, with Mrs. Emer Pixley of Kalamazoo, Mich., as Director in Charge.

CONNECTICUT.—*Hospital for Insane, Norwich.*—The last legislature made appropriations for two new ward buildings to accommodate 100 patients, and for three buildings for other purposes.

DISTRICT OF COLUMBIA.—*Government Hospital for the Insane, Washington.*—In the spring of this year the construction of five tubercular cottages was begun. They are now completed and ready for occupancy, having a capacity of 20 patients each.

ILLINOIS.—The State Charities Commission in its annual report urges that psychopathic hospitals be established, in large centers of population, for the care of acute cases and at which the commitment may be voluntary. It recommends that the present hospitals be used as colonies for chronic cases. It also recommends that the study of psychiatry be made compulsory in all medical schools.

A site for the new state hospital has been selected at Alton, where it is proposed to erect buildings on the cottage plan.

CHICAGO.—*Chicago State Hospital, Dunning.*—The institution was taken over from the County of Cook, July 1, 1912, in a very dilapidated condition. Extensive improvements in the mechanical department and several new buildings are badly needed.

There are under construction at present two cottages of modern type, with a capacity of 60 patients each. Plans are under way for the construction during the next year of a new power house with modern refrigerating plant, to take the place of two old and rather dilapidated plants now in operation.

The plumbing requires general overhauling and the installation of modern apparatus to take the place of the old devices now in use.

A new fence around the entire ground will be built.

A receiving building, equipped with modern hydrotherapeutic plant, will be constructed at a cost of \$275,000.

A nurses cottage to cost \$90,000 will be built as soon as practicable.

There has been a reorganization of the force of nurses and attendants to conform to the requirements of the State Board of Administration.

A training school giving a two years course has been organized to conform to the requirements of the board.

Women nurses have been put in charge of the male receiving wards and have proven satisfactory.

A dietitian has been engaged to supervise the preparation and distribution of food. The cooking for patients and employees has been centralized in one kitchen, with a very appreciable saving per capita cost.

Mr. A. C. Sloan of the Anna State Hospital has been appointed Chief Clerk to take the place of Acting Chief Clerk R. D. Marsh, recently appointed Chief Clerk at the Chester State Hospital.

INDIANA.—Plans have been made for the erection of the Marion County Detention Hospital at Indianapolis.

IOWA.—*Clarinda State Hospital, Clarinda.*—The water supply, which during the series of comparatively dry years past, has shown signs of exhaustion, with the extremely dry and hot weather of last summer, became a serious question.

The shortage of water has been very embarrassing; but fortunately, a new source was found, a mile and three-quarters away from the main institution, on hospital land, consisting of a subterranean water sheet from a little river in the neighborhood.

This supply, under severe tests, promises to be abundant; and equipment in the way of pumps, pipes, etc., to make this water available for the institution, is now being installed.

—*Cherokee State Hospital, Cherokee.*—A hospital for the tuberculous insane is now under construction. This building when completed will have accommodations for from 75 to 80 patients besides nurses and other employees. The building is of fire-proof construction throughout. In planning the building the architect and superintendent have incorporated their individual ideas, and so far as known, the plans have little if anything in common with buildings used for a similar purpose and inspected before the plans were completed. The usual amount of repairs and betterments have been in progress during the past six months. Work as a therapeutic agent is receiving more attention on the part of the staff than ever before and every effort is made to harmonize the therapeutic object of employment with the economic advantage to the institution.

—*Mt. Pleasant State Hospital, Mt. Pleasant.*—There is now building a hospital for tubercular insane. These patients have been treated in tents and on large porches during the past eight years. It is believed that much improvement has been made in the condition of some of the tubercular insane and the other patients have been protected because

of this isolation. This new hospital for the tubercular insane will be opened late this fall—and will be a part of this institution.

The hydrotherapeutic department in the new psychopathic hospital is giving remarkable results in the treatment of the acute cases. Of the outside work, farm and garden work; the garden has been gradually enlarged until now most all the vegetables for 1300 people are produced in it. Two new silos have been recently constructed and the dairy herd is one of the finest in the state, Holstein cattle composing the dairy herd. Several new buildings have been constructed on the farm such as barns, wagon sheds, cribs, etc. The wards of the institution are constantly undergoing repairs, being remodelled, new floors, new lavatories, bath tubs, etc., being put in.

KANSAS.—*Topeka State Hospital, Topeka.*—The opening of the Reception Hospital for acute service a year ago, has more than met expectations in its influence in stimulating the medical work of the hospital. The results from the hydrotherapeutic equipment have been satisfactory; nearly all the acutely disturbed cases responding well to the influence of water treatment.

A recent improvement in the equipment of the institution is in the completion of a new Custodial Cottage for women. This building is modern in all its appointments. The direct appropriation for this improvement was \$35,000. However, much of the work of construction was performed by the labor in the hospital. A fair estimate of the value of this labor would be \$10,000. The building has a capacity of 75 beds.

The activities of the institution just now are centered on the erection of a large dairy barn. The construction will be entirely of concrete; it will have a capacity for 120 cows, together with silos, feed rooms, and sterilizing equipment, where all the milk will be sterilized and bottled. The building when completed will contain a thoroughly modern and extensive dairy equipment.

—*State Hospital for Epileptics, Parsons.*—There has been little change during the last year, the staff remains the same and the general policy of the hospital is unchanged. A cottage for boys was opened a few months ago. This building will accommodate 40 patients, is a little removed from the other cottages and is very well adapted for its special purpose.

A cold storage and ice plant are now under construction. This will provide an abundance of ice and furnish rooms for the storage of meat, milk, vegetables, etc.

An ornamental iron fence will soon be erected, separating the front lawn from the street. The growth of the city makes the fence very desirable.

Considerable work has been done in improving the grounds. The prolonged drought of the summer has interfered with this work and has greatly reduced the garden and farm products.

During the past summer the dairy herd was tested for tuberculosis by the state live stock commissioner. None of the herd responded positively to the test.

The general health of the patients has been good, notwithstanding the extremely hot and dry summer.

There are about 475 patients in the hospital at present.

KENTUCKY.—*Central State Hospital, Lakeland.*—The Tuberculosis Hospital, opened a little more than a year ago, with a capacity of 30 patients, has reduced the death rate from this disease from 38 to 16, in one year. This is significant, but such a proportion cannot be hoped for, hereafter, as facilities are now as good as those of any institution of this character.

From July 1, 1911 to July 1, 1913, there have been only 28 cases of pellagra in the institution. Seven of these had the disease, when admitted. Two cases have, apparently, recovered; seven have improved, but still remain in the institution, and 19 have died. The greatest number of cases developed during the autumn of 1911, the number being smaller last year, and only a few cases have developed this year.

The first class in the training school for nurses graduated last June, eight young women having completed the course. The outlook for the coming year in this work is favorable. There is a library of 1000 vols. and moving pictures are still a success. There has just been completed a new concrete main sewer for the institution, and plans are on foot for the installation of a sewage purification plant next year. An appropriation for a new hospital and general kitchen is asked. The boiler room, recently damaged by fire, is to be rebuilt next year.

LOUISIANA.—*State Insane Hospital, Jackson.*—Two new buildings to accommodate criminal insane are being erected by patients.

MARYLAND.—*Spring Grove Hospital, Catonsville.*—A new fireproof building has been completed which will provide quarters for 100 women patients. In the basement are rooms for various industries and for the handicraft classes.

—*Springfield Hospital, Sykesville.*—Plans have been made for a psychopathic ward to cost \$80,000, which will be in the form of a cross and will be placed between the men's and women's groups.

—*Sheppard and Enoch Pratt Hospital, Towson.*—This hospital celebrated the sixtieth anniversary of its foundation on May 8, 9, and 10, 1913. The first day there was an address of welcome by Mr. G. A. Pope, President of the Board of Trustees; an historical address by Dr. E. N. Brush, the superintendent; an address by Dr. Edward D. Fisher on The Present Position of the Asylum as an Educational Factor in Medicine; and an address by Dr. Adolf Meyer, Director of the Henry Phipps Psychiatric Clinic. After this there was an inspection of the hospital and a buffet

supper served at the Casino. In the evening papers were read by Dr. W. R. Dunton, Jr., on The Work of the Hospital; by Dr. L. Gibbons Smart on Management and Treatment of Functional Nervous Conditions; by Dr. Seymour D. Ludlum on Etiology of Depression; and by Dr. Francis M. Barnes, Jr., on Hallucinations in Paresis.

The following afternoon an address was made by Dr. Edward Cowles on The Transition of American Psychiatry from the Asylum to the Hospital, a paper entitled The Mental Symptoms of Renal Insufficiency, with Report of a Case showing Remarkable Subnormal Temperature was read by Dr. W. B. Cornell, and papers by Drs. Ricksher, Fitz Gerald, Asper, and Wolff, were read by title. After this a dinner was served to about 60 guests following which an adjournment was made to the Amusement Hall where some very bright after dinner speeches were made by Judge Rose, Judge Duncan, Dr. Southard and others. The Doctors Orchestra and Chorus and Messrs. Scott and Charnbury furnished music which was greatly enjoyed.

The third day was given over to an athletic meeting and a bazaar where some of the work of the handicraft classes was sold. Dr. Herring, Secretary of the Lunacy Commission, Dr. Coggins of the Laurel Sanitarium, and Dr. Buckley of Friends Asylum, acted as judges. A number of cups and trophies were personally donated by members of the Board of Trustees, the names of the winners being inscribed thereon, medals being given to the latter for permanent ownership.

A new athletic field has been completed and was put in use during the past summer when it was used for the regular baseball games and for the semi-annual sports in September. This was more successful in bringing out a greater number of contestants than at the May meeting. It was gratifying to see men of over 50 taking the same interest as young men in their 'teens and striving just as hard to win.

An exhibit of the patients handicraft work was held at the Baltimore County Fair early in September where it attracted much attention.

The regular work of the training school will begin Monday, October 6.

A number of cases of paresis are being given the Swift Ellis treatment with rather interesting results.

Two of the old boilers have been replaced by Edgemoor boilers of over 200 horse power. The Roney mechanical stoker, which has been in use for a number of years, has been replaced by the Jones stoker which has been found to be very satisfactory.

A 6 ton ice plant has been installed which is so arranged with the older refrigerating plant that in case of a break down in either, the other can do all of the work.

MASSACHUSETTS.—Gardner State Colony, Gardner.—Two small cottages for paroled male patients have been completed, and a cottage for 30 women patients is well under way.

—Monson State Hospital, Palmer.—The number of patients at present cared for at this hospital is 915. The wards are filled to their capacity and

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the trustees have in hand an appropriation for \$130,000 for a new building for male patients. This is already well under way but it will be more than a year before it is ready to be occupied. The construction of this building and its location accentuates the policy of the Board of Trustees to develop on the line of three small institutions, one for the women, another for men and another for children. The new building is placed on the hillside in the vicinity of farm group where there are already several patients' buildings, and this will carry out the plan still further of segregating the male patients of adult years.

The field work has been continued during the year. A resumé of the subject was printed in the *AMERICAN JOURNAL OF INSANITY* in January, 1913. Since then many other cases have been investigated, the heredity in every case obtained as far as possible and the records of the individual made very full. This investigation has led to a special line on one family in which the results are rather remarkable and will be published in due course. A line of investigation with reference to the use of Crotalin has been specially followed out and some conclusions are apparently within reach.

The plans for the coming year are to make further accommodations for employees and to perfect a number of points in the service buildings.

MICHIGAN.—The legislature of 1913 appropriated \$200,000 for the purchase of a site and the erection of buildings for an institution for the colonization and care of epileptics. The commission appointed by the governor is now engaged in the location of a site.

Another important act by the same legislature provided for the creation of a commission, of which the director of the State Psychopathic Hospital is chairman, for making a survey of the state's defectives and delinquents. The report of their findings is to be submitted to the legislature in 1915.

—*Pontiac State Hospital.*—The legislature of 1913 made an appropriation for this institution of \$66,300 for erecting and equipping a building for men. This building, upon which the work has started, will be of two stories with large open wards and day rooms. It is designed for the bedridden and the semi-bedridden classes of patients.

The legislature provided also for the erection of a home for night nurses at a cost of \$15,000; also for the erection of a cold-storage plant at a cost of \$15,000.

MINNESOTA.—*St. Peter State Hospital, St. Peter.*—This hospital became so crowded that a number of patients were transferred to the other state hospitals.

—*State Inebriate Farm, Willmar.*—At the last session of the legislature a bill was introduced by W. T. Stone to abolish this institution and use the plant for a state tuberculosis sanitarium. Fortunately, the bill was lost by a vote of 48 to 24.

NEBRASKA.—*Hospital for Insane, Lincoln.*—There have been no changes in the medical staff. The training school for nurses began work September 29. The last legislature passed a law defining the duties of a board of control for state institutions. The present governor appointed this board which consists of the following members: Mr. Henry Gerdes, Judge Howard Kennedy and Judge Silas A. Holcomb. This board will have complete control of all matters relating to the insane hospitals of the state as well as the other state institutions.

Two new buildings are being opened; each accommodating 100 patients. One will be used as an infirmary for men and the other for women.

There is under construction at the present time a third new building. This building will be used for an amusement hall and the industrial department. The old amusement hall is being converted into an ironing room while the laundry is being enlarged and the ironing department taken out of the old laundry and put upstairs.

NEW HAMPSHIRE.—*New Hampshire State Hospital, Concord.*—A new unit for the accommodation of industrial patients was opened this last spring. Only the administration portion and one wing were completed. When finished the capacity will be for 424 patients. As far as is possible all patients working in the laundry, shops, and farm will reside here. The building has large congregate dining rooms, kitchen, and everything to constitute a complete working unit. It is distant about 800 feet from the power station, from which through a subway it receives heat, light, water, and steam for cooking. It is proposed to carry on in the large living rooms on the women's wards rug making, basketry, mending, sewing, etc. The men will nearly all work on the farm and in the shops, with the exception of such as are required in the wards, dining room, and kitchen.

The opening of this building, with the additional room thereby secured, made possible the final transfer of all the dependent insane from the county almshouses. State care of the dependent insane begun in 1903 meets, therefore, final realization in 1913.

Another room was opened in the men's industrial shop during the last year. Printing, the making of slippers, brushes, brooms, hosiery, and mattresses are the chief industries thus far installed. It is hoped that the next legislature will grant money for the erection of a new carpenter shop, in which event the entire building will be devoted to industrial purposes.

The last session of the legislature made a sweeping change in the management of all the state charitable and penal institutions. All boards of trustees were legislated out of office. In their stead a board of control was established. The board is appointed by the governor and council, and is to be made up of five members, the governor, the executive officer of the State Board of Charities, a purchasing agent, and two other members. The board of control assumes all the functions of the former boards of trustees. There are no longer any women on the governing boards of institutions. The purchase of all supplies is made

by the purchasing agent. Whatever may be the economic advantages of central purchasing of supplies, the removal of governing boards of trustees from the various institutions is much to be deplored.

NEW JERSEY.—*New Jersey State Hospital at Trenton*.—Money for several new buildings has been appropriated, and plans and specifications have been drawn, and construction of same will begin in a short time.

Ten thousand dollars for an addition to the present laboratory. For a criminal insane building, \$100,000 was appropriated last year, and \$50,000 at the last session of the legislature. This building is planned to accommodate all the criminal insane of the state, which are now cared for in the State Hospitals at Morris Plains and Trenton.

Psychopathic wards for the female patients, at a cost of \$40,000, are now under construction. This building is intended to care for new admission and convalescent patients, and consists of open air dormitories and private rooms. It is to be a separate building, only connected with the main building by a corridor 50 feet long.

Two thousand dollars was appropriated for X-ray apparatus.

During the year several new features have been added to the methods of caring for patients. In the fall welfare work was established, and Miss Rachel R. Schauffler was put in charge of the work for female patients, with Miss Minnie Van Gilder as assistant. Their work consisted largely in looking after special patients selected by the physician in charge. A certain class of patients in the State Hospital need special attention, which under ordinary conditions is lacking because of the fact that the physicians have all they can attend to in their medical work, and the nurses are occupied more especially with their professional work. These welfare workers organized reading classes, taught some of the patients German, others music, and assisted at the dancing classes which were in charge of an expert teacher from Trenton, took patients out for walks, nature studies, held tea parties on the various wards, and in every way possible endeavored to amuse and entertain as many patients as they could. Certain cases were given them for therapeutic reasons, and the results were satisfactory.

During the month of July a special post-graduate course was held in nervous and mental diseases, for the benefit of the new members of the staff and the local physicians. The lectures and demonstrations were held on Mondays, Tuesdays and Thursdays each week, and a conference on Friday evenings.

Dr. Cotton, medical director, lectured and demonstrated organic brain diseases, which included senile dementia, arteriosclerosis, general paralysis, criminal insane, and the newer pathological histology of the cortex, which was illustrated by colored lantern slides.

Dr. Clarence B. Farrar spoke on functional psychoses, manic-depressive insanity and psychoneurosis.

Dr. Katzen-Ellenbogen took up the defective class, epileptics, alcoholic insanity and border line cases.

The Friday evening conference was more informal, and the following subjects were discussed: Symptomatology and classification of mental diseases, Binet tests for defectives, and demonstration in the laboratory of microscopical specimens. Notwithstanding the hot weather, the physicians in general practice in the City of Trenton and vicinity attended the course faithfully, many of them being present at every demonstration. It is planned next year to give a more comprehensive course along the same lines.

—*State Village for Epileptics, Skillman.*—Three new cottages have been opened, one being the Weeks Memorial Hospital, named in honor of the first superintendent, the late Dr. Henry M. Weeks.

NEW MEXICO.—*New Mexico Insane Asylum, East Las Vegas.*—At the present time saturated solution of citric acid taken, two teaspoonfuls in water three times a day are being administered for epileptic convulsions, basing the rationale of the treatment on the recent discoveries that epileptic convulsions are due to viscosity of the blood. It can not be said at this writing that it is of any marked value, although in some cases it or something else has lengthened the intervals between the seizures.

There have been built two large sun porches, a new Kirker-Bender fire escape has been installed; two new underwriter's fire doors have been placed; three of the wards have been repainted and replastered; a new roof of asbestos shingles has been placed on one of the buildings and the erection of an annex of about 100 rooms is contemplated. This, however, is at present only in the formative stage.

Dr. Harry M. Smith, the former superintendent, was recently awarded \$9000 in a suit against the trustees for \$15,000 for breach of contract.

NEW YORK.—*Middletown State Homeopathic Hospital, Middletown.*—Improvements underway at this hospital during the past summer include work on the construction of a new power house, to take the place of one now outgrown; the installation of apparatus for hydrotherapeutic treatments and continuous baths in the new building housing the admission service; and extensive additions to the cement walks connecting the various departments of the hospital and serving as exercise ground in wet weather; also the alteration of all outside doors and such interior doors as might become jammed in event of fire, so as to swing outward.

The admission building (Ashley Hall) for 100 patients, equally divided between the sexes, gives excellent satisfaction, and in practice is found well arranged for the care of acute and convalescent patients, comfortable, and not unduly expensive in administration.

—*Utica State Hospital, Utica.*—Owing to lack of appropriations, it has not been possible to proceed with construction at the recently acquired Marcy site for the new hospital.

The training school commencement was held June 16, a class of 12 being graduated.

The number of patients admitted during the current fiscal year just closing, will be well over 400—the largest number of admissions to this institution since 1891, when the changes incidental to the State Care Act were in progress.

—*Manhattan State Hospital, Wards Island.*—The following is a list of improvements made during the past six months. These improvements, which were mentioned as being under way during the previous six months, are now completed: The rebuilding of the third story of the Psychiatric Institute, compressor room at power house, camp for tubercular men, installation of therapeutic apparatus in two new cottages, and addition to the assembly hall and a new mortuary.

The equipment of the entire institution with new locks is now under way but not yet completed. The concreting of the surface of the east dock is nearly completed.

A direct current generator set has been installed in the steamer *Parkhurst* and contract has been let for the installation of two new boilers in this boat.

An appropriation of \$90,000 has been allowed for a new nurses home but the actual work has not yet been started.

—*Gowanda State Homeopathic Hospital, Collins.*—Following are the improvements made at this hospital:

Tuberculosis building for 18 male patients.

New steam line from power house to superintendent's residence and staff house.

Addition to laundry building and new machinery, namely, mammoth mangle, washer and sterilizer.

Three new boilers allowed for power house.

Two Kirker-Bender fire escapes installed.

Farm barns newly shingled and painted.

New front porch at nurses' home.

Automobile garage.

New cement walks about grounds.

Concrete fence built along public highway passing grounds.

Recommendations of state fire marshall complied with, including changing doors to swing outwardly, installing fire doors, lining with metal the elevator and dumb waiter shafts, placing electric wires in conduits, erecting additional fire escapes, etc., etc.

—*Dannemora State Hospital, Dannemora.*—Owing to the fact that no funds were provided by the last legislature for special work, nothing new has been undertaken, but work for which funds were provided by the legislature of 1912 has been pushed toward completion.

A residence for the superintendent is approaching completion. The workmen are now engaged on the interior finishing.

About 8000 cubic yards of earth and stone have been removed and a foundation built for a new wing to accommodate approximately 100 patients.

An electric light line has been installed along the highway in front of the institution, water and electric lines extended to the superintendent's residence, and much grading and other extension of lines accomplished.

The institution has undertaken the operation of the stone quarry from which the building stone for the construction of the institution is obtained. This is operated under the hospital management by the use of patients' labor. The entire institution thus far has been built and will be completed by the institution's own organization and inmate labor.

The medical staff has been increased by the appointment of an additional interne, Dr. Harold Robert, who comes after completing a service as one of the house staff at the Champlain Valley Hospital.

The certified capacity of the institution is 358, while the present population is 540, but it will be impossible to make further provision for patients until additional funds are provided by the legislature.

—*Willard State Hospital, Willard.*—A new sewage disposal plant was completed and put into operation June 1. A contract was let early in the summer for an addition to the laundry to be used as a sorting room, the construction of which is now nearly completed. New dish-washing and serving rooms have been added to the dining rooms at the groups known as the Pines and Edgemere.

During the past six months the hospital has been unusually free from contagious or infectious disease; there was one case of typhoid fever, one of measles and two of facial erysipelas.

An attendant named John E. Rockwell, who entered the service in November, 1912, died July 30 as the result of an injury inflicted by a patient named Charles Michaels. He was stabbed with a piece of glass below the right eye, which made a horizontal incised wound less than half an inch long, which penetrated between the eyeball and orbital plate severing a branch of the internal maxillary at its point of exit into the orbital cavity, the hemorrhage from which flowed into the base of the cranium, causing death in a few minutes. The patient who made the assault is an epileptic and was known to have homicidal tendencies, having on previous occasions assaulted both attendants and patients; and it was for this reason he was kept on the particular ward where this unfortunate attack was made. Rockwell, who appears to have been taken unawares, was seated in a rocking chair with his back to most of the patients on the ward, when Michaels came up behind him and inflicted the injury. The patient was indicted by the grand jury for manslaughter September 15, and committed to Matteawan State Hospital September 20, as a criminal lunatic.

The Committee on Mental Hygiene and After Care met at the hospital May 2. The meeting was also attended by Mr. Everett S. Elwood, Executive Secretary, Committee on Mental Hygiene, State Charities Aid Asso-

ciation. This committee is composed of 12 members whose place of residence is so situated that the entire hospital district is provided for. During the last year 57 patients in all were referred to the committee. Two meetings are held at the hospital each year, and reports are made of the work done by each member, which enables the resident physicians at the hospital to keep in touch with many of the patients after they leave the institution.

During the fiscal year ending September 30, 15 patients were received on voluntary application.

—*Hudson River State Hospital, Poughkeepsie.*—This hospital was established by the legislature in 1867 and was opened for patients in 1871. It occupies 1000 acres of land on the east bank of the Hudson River midway between Albany and New York. The hospital district comprises eight counties (5000 square miles) with a population of 800,000. The needs of this district are met with a hospital capacity of 2800, although the census is usually over 3100. The staff numbers 20 and there are 620 employees. The yearly maintenance expense is over \$600,000. The hospital has an active service, receiving over 600 patients each year, and last year discharging 557 patients. A registered training school is maintained, having about 50 pupils. As in other New York state hospitals, modern psychiatric methods are made use of, and staff meetings are held at which every recently admitted case is brought before the whole staff and the diagnostic, etiologic, and prognostic features are discussed.

The hospital has a well equipped pathological laboratory with ample facilities for clinical and post-mortem work. The pathologist has no ward service, but devotes his entire time to laboratory work, frequently having medical assistance. The employment of a social worker as an aid to an out patient department is under consideration.

In the last summary mention was made of the work under progress, including the much needed accommodations for disturbed patients provided for by the additions in the course of erection at the Reception Hospital and at Edgewood. Both of these are well under way and will soon be occupied. The addition to the Steward's office will be occupied before these lines are printed.

Mention was also made of the arts and crafts room. This work has been extended in a more practical and more common place direction by the establishment of a hospital mending room adjacent to wards occupied by 600 disturbed women all chronic patients. A room, formerly used by men for smoking, has been equipped at practically no expense and about 70 disturbed women are employed at mending. This room has saved the hospital a considerable sum, as articles of clothing that previously had been considered beyond repair are now returned to the wards in useful condition. It furthermore supplies employment for a class of patients of limited opportunities for profitable employment.

—*Binghamton State Hospital, Binghamton.*—The hospital has long been in need of better electric lighting facilities. The old plant now in use has been in service 20 years. The cables are overloaded and the power is insufficient. Plans and specifications have been prepared for a new power plant of the "alternating" current type, which it is expected will be installed in the near future. An appropriation of \$60,000 has been made available for this purpose.

Plans for a large addition to the laundry are now being prepared. This addition will include new equipment. The entire plant will be operated by electricity and when completed will be ample for the care of 5000 people.

An appropriation of \$225,000 has been obtained for a new building for the care of women of the chronic class. This building will be erected west of the chronic building for men, Broadmoor, and will probably be connected with the Broadmoor kitchen, which, with some new equipment, will suffice for the cooking required by both buildings. When this building is available a much better classification of women patients will be possible. The disturbed cases now in the main building will be cared for in the new building and a more tractable class will occupy the main building wards.

One of the farm cottages—Parkhurst—is now lighted by natural gas. About two years ago a well was driven in the rear of the cottage, to the depth of 242 feet, with the expectation of obtaining a supply of good water. At this depth salt water was struck and with it came a moderate amount of gas, which, on being tested, was found to be satisfactory for illuminating and cooking purposes. No attempt, however, was made to use it for a long time, as it was supposed the supply would probably give out. Early during the past summer, the supply having proved continuous, a receiver was installed and since then the gas has been used for lighting the cottage, cooking in a gas range and operating an engine for power purposes.

The summer camp for patients, known as Pine Camp, which has been in operation for several years past, was occupied by women patients during the summer months. A number of improvements in the way of better accommodations have been made at the camp, and the patients sent to it have each been allowed to remain about two weeks. Nearly all to whom this privilege has been extended have enjoyed the outing and in almost every instance striking benefit has been noted, specially as regards gain in weight, the increase ranging from one or two to ten or 11 pounds after a fortnight's stay.

The annual field day exercises were held September 3. As usual they were of an interesting character and were participated in by a large number of patients and employees. Many visitors from the city were present. This occasion was the 22d annual field day held at the hospital, and it was an interesting fact that during the long period since 1892, in no instance has it been necessary to postpone the sports on account of interference by rain or storm of any kind.

During the summer months the entertainments for patients have consisted of band concerts on the lawn on Friday evenings, base-ball games Saturday afternoons, trolley rides and picnics. During the fall and winter

moving pictures on Wednesday evenings and patients' dances on Friday evenings will be the attractions in the assembly hall. The bowling alley will be an attractive feature of the employees' Dramatic and Social Club.

The plan of publishing from time to time a small paper full of items of interest at the hospital, has been adopted during the past year. This paper is called the "Meteor." The first number appeared at Christmas 1912, the second was issued by the graduating class of the nurses' training school in July 1913, and the third number commemorated the field day exercises.

—*Kings Park State Hospital, Kings Park.*—The new tubercular group, providing beds for 200 women and 50 men, was opened on March 25, 1913. This group is located on an elevated site apart from other hospital buildings, and has proven most satisfactory.

Despite the fact that 950 beds have been added to the hospital in less than two years, with an admission rate of approximately 1000 patients for the current year, and a present census of 4125, there is still an excess of over 700 patients above the rated capacity of the institution, so that a considerable degree of overcrowding still exists.

An inter-hospital conference was held June 26 and 27, and the program consisting, for the most part, of papers presented by members of the staff was of a high order of excellence.

In July, a clinic was held for the benefit of Dr. Charles Davenport's Class of Eugenics Field Workers of the Eugenics Record Office, Cold Spring Harbor, New York.

The death of Dr. Howard T. Paffard, medical interne, occurred May 1, 1913, at the home of his parents in Southport, Connecticut. The doctor had not been in good health for some time, and at the time of his death was upon a leave of absence because of his poor physical condition. Although Dr. Paffard had been in the service of the hospital for a comparatively short time he had nevertheless manifested unusual capabilities, as well as a most agreeable personality, and the news of his demise was received with great sorrow both on the part of the patients and employees, with whom he had come in contact, and his professional associates upon the medical staff.

During the past year three patients have been taken to court upon writs of habeas corpus. Of these, two patients were remanded to the hospital, one after the taking of evidence, and one after the dismissal of the writ on motion of the petitioning attorney, who made such motion after a talk with the patient. In the third case arrangements were made to care for the patient at a Soldiers' Home, and he was, therefore, discharged from the custody of the hospital.

Commencement exercises of the Training School for Nurses were held on June 5, 1913, and 19 graduates received their diplomas.

A new lecture room for the use of the training school has been established and has been equipped with proper furniture, including new classroom chairs with broad arms for note-taking.

During the year especial emphasis has continued to be placed upon occupational activities, while two day schools, largely for dementia præcox patients, have been maintained in addition to the usual basket classes, fancy work classes, etc. All the male patients in the physical culture class, being almost entirely convalescent cases, were recently given a clam-bake upon the beach of Long Island Sound adjacent to the hospital grounds, which, needless to say, was greatly enjoyed by everyone present. The women patients, who are members of similar classes, have had several picnics during the season, both in the hospital grove and upon the beach. Carrying out the idea, however, of not forgetting patients engaged in the ordinary occupations of the institution, picnics have likewise been given at various times for the patients employed in the laundry, tailor shop, various sewing rooms, etc.

Moving picture shows are held regularly and are much appreciated by the patients.

During the past spring a baseball club was formed among the employees of the hospital, which has had a most successful season, having lost but a single game since regularly organized, although playing weekly with the best semi-professional clubs of Brooklyn. The weekly game has been held each Saturday afternoon, and each game has been witnessed by approximately 2000 patients. The expense has been largely met by benefit picture shows and dances voluntarily inaugurated by the employees, as well as by very liberal donations from the Employees' Club. The expense, therefore, to the hospital of maintaining a team has been comparatively little.

During the past year the addition to A-B kitchen has been completed, affording much needed additional dining room space for the medical staff and the clerical force.

Two continuous bath tubs are being installed upon the men's reception service, while two similar tubs, formerly in use upon another service, have been installed upon the women's reception service. Upon the latter service a complete hydrotherapeutic room is now being equipped.

In 1912, an appropriation for \$15,000 was made for increasing the water supply and six wells were drilled, averaging over 470 feet in depth. The water is of excellent quality, being soft and with a chlorin content of less than five parts to a million, which, as the wells are less than one-half mile from Long Island Sound, is an exceedingly small proportion.

During 1912, another appropriation of \$110,000 was made for the construction of an extension to the new boiler house to accommodate additional boilers for remodeling the electric lighting system of the institution, and for changing the heating system, required in the consolidation of the heating plants, into a unit system for more economical administration. Under this appropriation an extension to the boiler house has been built to accommodate three 350 horse power water tube boilers (allowed under a previous appropriation), as well as an extension to the dynamo room which accommodates two 300 k. w. turbine generators, one large air compressor, and the switchboard provided under the same appropriation.

From this appropriation there have also been installed two turbine feed water pumps and two turbine main water supply pumps, all of which are in operation. From the same moneys a vacuum heating system has been installed in the older buildings of the institution, and an automatic draft system for the boilers, new steam piping to the amount of over \$15,000, hot water heaters, record machines, etc. With the turbine pumps and engines, vacuum system and automatic control of the boilers, it has already been demonstrated that a very material economy will be effected in heating and lighting the institution.

In connection with the electrical work the old, single phase, alternating current, 125 cycle generators of obsolete type, are being replaced by alternating current, three phase, 60 cycle generators which are directly connected to turbines; the exhaust steam from the turbines being utilized in heating the wards, as well as in heating the hot water tanks throughout the hospital.

A cement block machine and concrete mixer have been purchased which have been of great assistance in carrying out the large amount of new work about the institution.

A new mechanical shop of two stories—100 x 40 feet with an extension wing built of concrete blocks has been constructed by the employees and patients of the hospital, with the assistance of a few mechanics employed by day's labor at a cost far below the sum which would have been required had the building been constructed in any other manner. This building will house the carpenter shop, the electrical shop, the plumber's shop and mason's shop, they having heretofore been scattered at different points about the grounds.

In each of the five large kitchens of the institution, individual refrigeration machines are being installed for the direct refrigeration of food supplies. By this means it is expected that considerable economy will be effected, while at the same time the labor of handling ice will be obviated.

Additional heat has been installed in several of the wards, while a contract is about to be let for rewiring buildings A, B, C, and D.

The hospital has installed underground conduits to the men's and women's cottages for telephone and fire alarm cables, at the same time installing an extra conduit, for the purpose of putting the present aerial lighting wires under ground, the latter not only being unsightly but being so frequently damaged by storms, that a considerable amount of labor is required to keep them in repair.

With the ever increasing size of the hospital the sewage disposal plant was found to be inadequate and work is now nearing completion whereby its capacity will be nearly doubled.

Using only hospital labor small frame buildings have been erected at the rear of building A and of building B, to serve as storage rooms for ward supplies and to keep soiled linen.

A new concrete garbage vault is rapidly nearing completion for A-B kitchen, while the work of replastering two-thirds of the nurses' home has been finished.

Seventy-six acres of woodland have been cleared and is to be prepared for cultivation as soon as possible, the stumps having already been removed from 15 acres. This added acreage under cultivation will materially increase the farm activities of the hospital.

Another year's experience with the waste accounting system and basic dietary ration tables, as developed at this institution, has further demonstrated the economy and advantage derived from a closer supervision of kitchen and dining room operations than is sometimes usual in institutions. So far as is possible to determine from correspondence with other institutions where this system has been introduced, the experience in this regard has been common to all using the system.

During the present year the hospital has received appropriations of \$80,000 for additional accommodations for chronic patients, of \$5000 for renovating some of the wooden cottages, \$12,200 for new elevators in groups II and III, as well as an appropriation of \$50,000 for the remodeling of the heating plant, and with this latter appropriation it is desired to install two 500 horse power water tube boilers to extend the vacuum system to the remaining wards of the institution, to install an additional air compressor and two new vacuum pumps, and connecting up the lighting system with the new dynamos.

—*Craig Colony for Epileptics, Sonyea.*—Iroquois Dormitory, a new brick and stucco structure of fireproof construction, accommodating 60 males has been occupied since early in the summer. It does not increase the capacity of the colony as the patients were all transferred from Six Nations Dormitory, an old frame four story building which is to be razed.

A contract has been awarded for the installation of a softening and mechanical filtration plant to treat all water used except that for fire protection and for flushing plumbing.

The Villa Flora, the administration building in the women's group is being extensively repaired.

During the summer ten buildings had the exterior painted and one dormitory had a white stucco finish applied.

An appropriation has been received of \$50,000 for installing part of an up-to-date power and central heating plant. This sum will probably be sufficient for the power plant proper.

Funds are now available for substituting sand for gravel in the larger part of the sewage filtration beds.

The third floor of Spratling Hall has been finished, thus affording seven additional rooms for officers.

The Colony Training School for Nurses is now affiliated with Bellevue Hospital, New York City.

A material increase in wages for male supervisors, attendants, both male and female, and some other employees takes effect October 1, 1913.

Inasmuch as the colony has to compete with state hospitals for insane a difference in wages in favor of the latter had worked a hardship on the colony. It is expected that before long the entire schedule of salaries

and wages in New York state institutions will be made the same for like service irrespective of the department under which the institution may be placed.

On May 27, 1913, the laundry was damaged by fire to the extent of \$23,000. The probable cause of the fire was from an old dry room. Funds cannot be secured before the 1914 legislative session for restoring the building and replacing equipment.

On August 17 an old barn with contents, 100 tons of hay and some plows were destroyed by fire, cause unknown.

—*Bloomington Hospital, White Plains.*—Clinical investigation has been specially concentrated on certain topics, which are in the center of psychiatric interest at present, *e. g.*, dementia præcox and allied conditions, syphilitic and so-called metasyphilitic disorders. The aim has been to do more intensive work in the study of suitable cases, and for this purpose the psychogalvanometer in the psychological laboratory has been of considerable help. Functional cases, especially incipient cases of doubtful prognosis, were as a rule the subject of detailed analysis; during convalescence in many cases a thorough analysis was undertaken as a prophylactic measure in view of the possibility of recurrence.

The general organization of the daily activity of the patients from the point of view of re-education has received increasing attention. This has involved further elaboration of the occupation department and of the physical culture department, and the patients' library has been considerably augmented. Four instructors are employed in the re-education of the women, and two in the work with the men. Outdoor occupations and diversions will be employed more extensively during the summer.

In the study of the organic cases the Wassermann method has been used wherever indicated; Dr. Amsden has examined the blood serum and cerebro-spinal fluid from patients in the New York hospital, the total number of examinations during the year amounting to 1216. In treatment of organic disorders selected cases have received intravenous injections of salvarsan.

A considerable addition to the medical library has been welcomed by the medical staff.

All cases admitted to the hospital have been discussed in conference by the whole staff. In addition monthly evening meetings were held for the purpose of more formal and systematic presentation and discussion of psychiatric topics. The practitioners in the neighborhood have gladly accepted the invitation to be present at these meetings, and have thus added greatly to their value.

The cases admitted to the hospital have to a certain extent represented the increasingly practical interests of psychiatry. Preference has been given to cases where cure or improvement could be expected from intensive study and treatment. In order to carry out the work effectively, many custodial cases which had accumulated were transferred to other hospitals.

With a view to improving the sanitary condition of the hospital, the

water from the deep well has been piped separately to all the dining rooms and to the kitchens. This water is practically free from germs. In the management of the dairy every precaution is taken to secure a pure product. A thoroughly equipped dairy building is now in operation. The sun parlors connected with the wards, where excited patients are cared for, are being remodeled with a view to opening them up much more freely to the air. These may be utilized as sleeping porches.

The methods of nurse training have been considerably elaborated under the direction of Miss Poston. Arrangements have now been made for a three years course, one year of which will be given at the New York hospital and an obstetrical hospital. The two years course will also be continued, and arrangements will be made for courses for graduates of other schools. Three nurses from the Johns Hopkins Training School have spent some time at the hospital preparatory to taking up the work at the Phipps' Psychiatric Clinic. The nurses' quarters have been thoroughly renovated and improved.

NORTH CAROLINA.—*Western Hospital for the Insane, Morgantown.*—The present number of patients is 1342, and there are over 300 applications for admission on file. The last legislature made an appropriation of \$50,000 for a building to accommodate 150 women patients which is now under construction.

NORTH DAKOTA.—*State Hospital for the Insane, Jamestown.*—A new dormitory building is planned to consist of four stories and a basement. It is so arranged that wings may be added at each end to increase its capacity.

OHIO.—*Athens State Hospital, Athens.*—More systematic industrial work is being done than ever before especially with the newly admitted patients. An industrial teacher is employed who has a large class, doing all kinds of needle work and basketry, and most of these patients are quite apt and efficient in their respective lines. The industrial class meets in a large commodious hall, and associated with those mentioned above is a class made up of the unwilling workers, who are taught an interest, so far as possible, in the more elementary and simple lines of industry, including some of the arts of domestic science and kindergarten. It is found that by having the two classes associated that the spirit of activity and interest of class number one is to a degree contagious to the patients that make up the second class, and it has a decided beneficial influence upon them to be thus associated. It is believed that the same spirit should prevail in classifying the patients on the various wards in maintaining the highest standard possible in the appearance and activity of the ward so that disinterested and destructive patients may be elevated as nearly to this standard as possible.

PENNSYLVANIA.—The semi-annual meeting of the Association of Trustees and Superintendents of the Insane and Feeble-Minded of Pennsylvania met at the State Homeopathic Hospital, Rittersville, May 22, when a symposium on manic-depressive insanity was held. Addresses were made by Drs. C. R. McKinnis, H. Mitchell, Owen Copp, J. Allen Jackson, H. B. Meredith, and Henry Klopp.

—*State Asylum for Chronic Insane, Wernersville.*—An old roller mill on the grounds of this hospital was destroyed by fire July 7, 1913, causing considerable excitement among the patients. A bucket brigade was formed by 300 men patients who saved the adjoining structures. The loss was \$6000.

—*State Hospital for the Insane, Warren.*—The legislature granted a total of \$195,000 special appropriation for use during the coming biennial period. Of this amount \$125,000 is to be expended in the construction of a new power plant, the work upon which has been started.

A fire alarm system with fire fighting apparatus is to be installed at an expense of \$5000. A superintendent's dwelling is to be erected at an expense of \$10,000. A detached cottage for the treatment of contagious diseases will be built at an expense of \$5000.

The plumbing and flooring of all bath-rooms, lavatories, closets, and dining rooms in the main building, are to be replaced at an expense of \$41,000.

The remainder of the total appropriation is to be used for minor repairs.

Plans are under consideration for placing a request with the next legislature for funds to construct a detached building for the admission and treatment of new patients.

—*Friends' Asylum, Frankford, Philadelphia.*—The hospital held its centennial celebration in June last. Addresses were made by Alexander C. Wood, President of the Board of Trustees, Franklin Smedley, Chairman of the Committee on Farm and Grounds, Rudolph Blankenberg, Mayor of Philadelphia, Dr. Frank Woodbury, Secretary of the Committee on Lunacy, and Dr. R. H. Chase, Superintendent.

After the exercises there was an inspection of the buildings and grounds followed by a collation on the south lawn.

Among the greetings and congratulatory messages was one from the York Retreat, England, widely known as the mother institution, and another from the Phipps Psychopathic Clinic, Baltimore, designating herself the youngest of the sisters.

In connection with the centennial a large illustrated volume, giving a descriptive account of the institution from its foundation was published, a copy of which may be had on application to Dr. Chase, if not already supplied.

—*Philadelphia Hospital for the Insane, Philadelphia.*—General progress has been made in the care of the inmates of this hospital. This has been in part accomplished by overcoming the overcrowded condition. The overcrowding was reduced by the transfer of 100 male cases to the Norristown State Hospital for the Insane, the restriction of admissions to this hospital (The cases of Philadelphia County going direct to the Norristown State Hospital), and the further development of Byberry City Farms.

General sanitary improvements; improvements of discipline; systematic regulation of laundry and supplies; the institution of a course of training for the attendants; the installing of additional card systems and records; the erection of tents for the bedridden tubercular cases, comprise the principal improvements at the main institution.

At Byberry City Farms, general improvements of the grounds, buildings, discipline, etc. Buildings were erected to care for the male and female tubercular insane. Colonies were opened for the care of the convalescent and mildly insane. Buildings are under way for epileptic colonies, and one of these is almost ready for occupancy.

—*State Hospital for the Criminal Insane, Fairview.*—This institution is the only one in the State of Pennsylvania for criminal insane and is for the accommodation of all of that class in Pennsylvania. It is located in the northeastern section of the state, Canaan Township, Wayne County, the post office being Waymart. The name of the railroad station is Fairview, so named because of the extensive view obtainable from the institution in all directions. It is located on an elevation of 1800 feet above sea level. The distance from Philadelphia is 190 miles, and from Scranton the largest city near is 19 miles. The law creating the institution was passed at the session of 1905. There are 760 acres of land on the crest of the Moosic Mountains. At the present time there are custodial buildings which accommodate 170 inmates, that being the number now incarcerated. At the last session of the legislature an appropriation of \$295,000 was received, \$245,000 of which is for building purposes. During the coming year it is proposed to erect two custodial buildings which will double the capacity, a hospital proper which will contain all modern equipment for the general treatment of all forms of diseases, also barns, sidewalks and roads and in other ways beautify the extensive grounds.

Among the inmates now incarcerated there are 54 murderers and over 60 who have made an attempt to murder besides the 54. The first patient was received, December 16, 1912, and during the following month 80, and since patients have been received weekly until there is a total of 170. There are no walls around the grounds and the patients are taken out, when weather will permit, daily for exercise, excepting a few of the most dangerous, who have to have their exercises in the day-rooms. Since the first day a patient entered this institution no form of mechanical restraint has been used. But three patients have been locked in private rooms, there being no "cells," but all rooms, 12 x 10 and 12 x 8 feet. Superintendents and men gifted in the care of the insane, particularly of the

criminal insane, when visiting are astounded at the results obtained. There have been no escapes and yet there are from 26 to 30 patients employed outside at different forms of labor, farm work and whatever other duties they can perform. There has never been an accident of any kind and on the whole the results have been marvelous.

The hospital as planned, will, when completed, accommodate 500. The material used in the construction is brick, stone and iron, the buildings are absolutely fire-proof and while not unduly ornamental they are very handsome.

The officers and employees are: Board of Trustees, Hon. Henry F. Walton, President; Hon. Wm. C. Sproul, Treasurer; Hon. Sterling R. Catlin; Hon. Walter McNichols; Hon. H. A. Denney; Hon. E. A. Jones; Hon. James Marsteller; Hon. C. H. Dorflinger; Hon. John B. Fassett; H. G. Ashmead, Secretary Board of Trustees; Thos. C. Fitzsimmons, M. D., Superintendent; Geo. W. McCafferty, M. D., First Assistant Physician; Miss Della M. Gildea, Secretary and Stenographer to Superintendent; Buel Dodge, Chief Book-keeper; P. F. Devine, Store-keeper; M. J. McDonnell, Chief Supervisor of Guards; Miss Elizabeth Cavanaugh, Housekeeper; E. C. Sarine, Chef; Moses T. Spangenburg, Outside Foreman; Allan P. Utt, Chief Laundryman; Rev. Thos. F. Coffey, Roman Catholic Clergymen; Rev. E. A. Gillespie, Methodist Chaplain.

The D. & H. R. R. Company have erected a beautiful station on the institution grounds, which is only five minutes walk from administration building. Carbondale, a city of 17,000 population is three miles distant from the institution. The Delaware, Lackawanna & Western Road extends from New York City to Buffalo, passing through Scranton, a distance of 19 miles from the institution. The Pennsylvania Railroad extends from Wilkes-Barre, a distance of 37 miles from the institution. The institution proper is reached by the Delaware and Hudson Railroad, either from Wilkes-Barre or Scranton.

SOUTH DAKOTA.—*Asylum for Insane Indians, Canton.*—Ground has been broken for the new \$35,000 hospital building, which is to contain an operating-room, dispensary, laboratory, morgue, hydriatic room and a solarium for consumptives. Bids have also been asked for the construction of a new well, and a steel tank of 30,000 gallons capacity on an 80 foot tower. The asylum will shortly receive a twelve-passenger motor-bus for the recreation of the patients.

UTAH.—*State Mental Hospital, Provo.*—The treatment may be summarized as follows—occupation, re-education, and recreation, coupled with non-seclusion and non-restraint. In many cases occupation is really re-education, as for instance when a patient accustomed to sedentary pursuits is given some out-of-door task, it is almost invariably found that the entire change in habits, necessitated by the change of work, results most favorably. The mere fact of getting closer to nature acts more beneficially than all the drugs in the materia medica combined. On this

point of re-education, many think that out-door work, suitable to the patients' health and strength is far more efficient in the up-building of the patients than the mere manufacturing work as carried on in the industrial department. It is believed that the public institutions are doing more for their patients than the private, as in the private institutions the home environment and atmosphere are carried too far, old servants being permitted to accompany the patients, and the patients themselves being allowed to live and act pretty much the same as if at their homes; whereas, there ought to be a complete change, not only of people and environment but also of being and living. The change itself is of great therapeutic importance—a fact that has been admitted by many people of experience.

All of the patients are out of doors whenever the weather is favorable, from three to five hours every day; and by "out of doors," it is not meant in airing-courts, but out on the grounds; the women strolling about the lawns or enjoying the swings, working in flower beds, and in the small-fruit season, employed in picking and preparing the fruit. The men unable to work are enjoying themselves under the shade trees. Even in the winter a great many of the women are employed in rotation in preparing fruit and vegetables for table use. The whole of the laundry work is done by patients, under supervision, and in the industrial room, all the clothing for the institution is made, with the exception of men's suits. There is a department for rug weaving connected with the industrial room, a department for basketry and manual training, in addition to the school-room. Male patients are employed in the various departments, and on the farm and grounds.

As regards recreation, there is base-ball, croquet, and pass-ball, and it is planned to install this summer an out-of-door gymnasium, consisting of horizontal bars, roman rings, ladders, etc. The construction of a large tank to be filled with water in connection with a sort of "Shoot the Chutes," where the patients can slide down an incline and plunge into the tank, is being considered. It is thought the shock will have beneficial results. During the spring, fall and winter seasons, there is an entertainment each week, consisting of concerts, recitations, motion pictures, interspersed with occasional dances.

A remarkable fact has been brought out through the use of the circular fire escapes. At first there was the greatest difficulty in persuading the patients to enter them. They, however, soon became so accustomed to them that now when patients on the upper floors have occasion to go out-of-doors, they invariably use the escape in preference to the stair-cases. Many of the patients have stated that they can trace their first steps towards recovery to the unwonted sensation caused by the rotary motion and the swift current of air encountered in going down these escapes. It is thought there is probably a great therapeutic principle hidden here; and it is believed that every institution in the country should be equipped with these circular escapes, not only for their life-saving purposes but also for therapeutic results. There is a fire drill once every week in the summer,

and the patients seem to take it as a huge "Lark." Incidentally, the institution can be cleared of patients in three minutes from the time the alarm is given.

From long observation, it is believed that the bullying, antagonistic frame of mind and attitude, too often affected by inexperienced attendants is the main cause of so much excitement and perturbation among disturbed patients. In a small institution like this it has been possible to practically eradicate this evil and also carry out thoroughly the policy of non-restraint and non-seclusion. Occupation, recreation, and plenty of fresh air, together with the generation of a warm, friendly spirit between staff, attendants and patients, seems to be the ideal treatment for all classes of the mentally afflicted. Some of the most disturbed patients are employed daily on the farm, in the orchard, and about the grounds, and the results so far, have been most beneficial.

There is being completed a new dairy and horse barn for 50 Jersey cows and 16 head of horses, with calf pens, etc. The barn is thoroughly up-to-date, equipped with the James patent stanchions and feeding troughs, and built of concrete and pressed brick, with rooms for the farmers, complete with bath and toilet. During the year there has been installed a new Rinck bake oven, with a capacity of 350 loaves per baking, together with all necessary equipment, and in the kitchen a new range, together with some new steam cookers and other apparatus. In the laundry has been installed a new American mangle, 72 inches in width, and a 26 inch N. and K. type solid combination extractor. The dairy is equipped with a new barrel churn, cream vat, milk cooler, sanitary milk pails, and a Babcock apparatus for testing milk, and a new sink.

The building has been re-wired by the engineering staff, on the conduit system. Eight of the wards and the administration building has been refloored with maple flooring, and it is expected to finish the rest of the wards and rooms this year. Another section has been added to the greenhouse, and during the last year a new concrete reservoir of 250,000 gal. capacity has been built. It is contemplated piping the water from an unfailing mountain spring, in a canyon 3 miles distant, which will give a pressure of 110 pounds to the square inch. Also furnishing operating and treatment rooms, besides adding more apparatus to the department for electrical treatment.

An up-to-date piggery will also be erected.

VERMONT.—A mental hygiene exhibit and conference was held in Rutland, May 19-23, under the auspices of the National Committee for Mental Hygiene. The chairman of the local committee was Dr. E. Ray Smith of Rutland. Public meetings were held on Monday evening and on the afternoons and evenings of Wednesday, Thursday, and Friday. They were well attended and considerable interest was aroused.

WASHINGTON.—*Eastern Hospital for Insane, Medical Lake.*—The improvements completed and contemplated for this hospital are:

An addition to the hospital farm building.....	\$6,000
A new kitchen.....	10,000
Replacing fir flooring with white maple, 3 wards.....	2,500
A new concrete stack, 150 ft. high.....	5,000
A new fire station.....	6,000
A new green-house.....	3,000
A new barn.....	5,000
Two new silos, 200 ton capacity.....	700

Grading and seeding 5 additional acres of lawn.

WEST VIRGINIA.—*Second Hospital for Insane, Spencer.*—One ward on the female side, which has never been occupied, has been remodeled and brought up-to-date, and will accommodate 60 patients. Another ward on the same side was remodeled by erecting metal ceiling and placing electric lights in the rooms. All the wards in the institution have been painted.

One of the greatest improvements ever added to the institution has been made during the past six months. This is an artificial lake. The question of water supply has always been a source of worry to the management, owing to the peculiar geographical formation of the earth in this vicinity. Several methods have been used in trying to solve the problem, such as a dam in Spring Creek, artesian wells, and a two and one-half million gallon reservoir. All these have failed, and it is believed the construction of this lake, which will hold ten million gallons of water, will relieve the situation. The lake will be fed from Goff's run and the 12 artesian wells now in operation.

There is under construction a brick house and dairy barn which will be modern, and therefore sanitary. It will probably be the finest in the state.

An 80 ton silo was erected last October, which affords ample ensilage for the herd of Holsteins.

The ice and refrigeration plant as well as the bakery have been remodeled during the year.

Plans have been drawn for the erection of six large sun rooms, which will be built in the near future.

ONTARIO.—A new provincial hospital is being established 20 miles east of Toronto, near Whitby and facing on Lake Ontario, to take the place of the Toronto Asylum for Insane. The site consists of 640 acres and is said to be admirably adapted to its purpose. The institution will have accommodation for 1500 patients and will be so constructed that additional units, accommodating 500, may be added at any time. There will be a farm, recreation grounds, a chapel, and an amusement hall. Prison labor is being used in the construction.

A recent report gives the total number of insane under care in this province as 5726, of whom 2769 are men and 2957 women, or an increase of 86 during the year. The admissions were 1247, an increase of 103. There were 460 deaths, 570 discharges, and 258 deportations. From 1882 to 1886 there were 2775 patients, and in the following periods of five years

the number has increased as follows: 3201, 3865, 4604, 4933, and 5517. Of the 1247 admitted during the year 890 inherited a predisposition to insanity.

CANADA.—*Protestant Hospital for Insane, Verdun*.—A new cow stable, two stories in height with stalls for 36 cows, and containing a feed room, milk room, and silo, is being erected and rapidly nearing completion. The stalls are to be of iron and the manger floors are laid with concrete.

The room formerly used as an amusement hall has been partitioned into two and now furnishes two large airy and well lighted dormitories, which are being used as observation wards, one for men and one for women.

SASKATCHEWAN.—The new provincial hospital at Battleford is nearly completed. Dr. J. W. McNeil of Hanley has been appointed superintendent.

Appointments, Resignations, Etc.

- ANDERSON, DR. ALBERT, appointed Superintendent of State Hospital at Raleigh, N. C.
- ANDERSON, DR. C. H., Superintendent of Chester State Hospital at Menard, Ill., resigned.
- ANDERSON, DR. JOHN B., Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned July 31, 1913.
- ARMES, DR. G. W., Superintendent of Kentucky Institute for the Feeble-minded, resigned.
- ATHERTON, DR. C. C., Assistant Physician at Elgin State Hospital at Elgin, Ill., transferred to Lincoln State School and Colony at Lincoln, Ill.
- ATHON, DR. W. L., Superintendent of Anna State Hospital at Anna, Ill., resigned.
- AUSTIN, DR. HENRY A., appointed Interne at New Jersey State Hospital at Trenton.
- BARNES, DR. FRANCIS M., JR., Clinical Director at Government Hospital for the Insane at Washington, D. C., resigned June 8, 1913, and appointed Assistant Professor of Nervous and Mental Diseases in the St. Louis University School of Medicine at St. Louis, Mo. He will also enter private practice in St. Louis.
- BIGGS, DR. M. O., appointed Superintendent of Hospital No. 1 at Fulton, Mo.
- BISHOP, DR. HARRY A., Junior Assistant Physician at New Jersey State Hospital at Trenton, resigned and has entered private practice in Washington, D. C.
- BRADLEY, DR. W. P., appointed Superintendent of Hospital No. 3, at Nevada, Mo.
- BYNON, DR. MARGARET HUGHES, appointed Woman Assistant Physician at Pontiac State Hospital at Pontiac, Mich., July 1, 1913.
- CAMPBELL, DR. GEORGE B., appointed First Assistant Physician at Utica State Hospital at Utica, N. Y., September 1, 1913.
- CAMPBELL, DR. JOSEPH M., appointed Superintendent of Watertown State Hospital at Watertown, Ill.
- CAREY, DR. CHARLES J., Assistant Physician at Springfield State Hospital at Sykesville, Md., appointed Superintendent of the new Eastern Shore Hospital at Cambridge, Md.
- CAREY, DR. H. M., Superintendent of Eastern Pennsylvania State Institution for the Feeble-minded and Epileptic at Spring City, resigned and has opened a private institution for treatment of feeble-minded and epileptic.
- CARMICHAEL, DR. FRANCIS A., appointed Superintendent of Osawatomie State Hospital at Osawatomie, Kans.
- CARSON, DR. H. R., appointed First Assistant Physician at State Hospital for the Insane at Norfolk, Neb.
- CASE, DR. W. E., appointed Superintendent of Northern Hospital for Insane at Cedro-Woolley, Wash.
- CLOGHER, DR. RALPH E., Assistant Physician at Utica State Hospital at Utica, N. Y., resigned April 15, 1913.
- CONZELMAN, DR. FRED. J., Assistant Physician at Manhattan State Hospital at Ward's Island, N. Y., granted leave of absence for one year from August 23, 1913, to pursue special studies in Europe.
- COOK, DR. WALTER C., Third Assistant Physician at Mt. Pleasant State Hospital at Mt. Pleasant, Iowa, appointed Assistant Physician at Kankakee State Hospital at Kankakee, Ill.
- COOPERSTEIN, DR. JOSEPH, appointed Assistant Physician at Chester State Hospital at Menard, Ill.
- COYLE, DR. WILLIAM E., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., May 26, 1913.
- DAVIS, DR. THOMAS K., appointed Medical Interne at Manhattan State Hospital at Ward's Island, N. Y., June 12, 1913.
- DAWSON, DR., appointed Assistant Physician at Hospital No. 3 at Nevada, Mo.

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- ATHON, DR. W. L., Superintendent of Anna State Hospital at Anna, Ill., resigned.
- AUSTIN, DR. HENRY A., appointed Interne at New Jersey State Hospital at Trenton.
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- CARR, DR. W. E., appointed Superintendent of Northern Hospital for Insane at Cedro-Woolley, Wash.
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- CONZELMAN, DR. FRED. J., Assistant Physician at Manhattan State Hospital at Ward's Island, N. Y., granted leave of absence for one year from August 23, 1913, to pursue special studies in Europe.
- COOK, DR. WALTER C., Third Assistant Physician at Mt. Pleasant State Hospital at Mt. Pleasant, Iowa, appointed Assistant Physician at Kankakee State Hospital at Kankakee, Ill.
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- COYLE, DR. WILLIAM E., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., May 26, 1913.
- DAVIS, DR. THOMAS K., appointed Medical Interne at Manhattan State Hospital at Ward's Island, N. Y., June 12, 1913.
- DAWSON, DR., appointed Assistant Physician at Hospital No. 3 at Nevada, Mo.

- DETTWEILER, DR. WILLIAM E., appointed Dental Interne at Government Hospital for the Insane at Washington, D. C., April 10, 1913, and resigned August 31, 1913.
- DOOLITTLE, DR. GLENN J., Medical Interne at Craig Colony at Sonyea, N. Y., promoted to be Junior Assistant Physician August 1, 1913.
- DUNNING, DR. RALPH, Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., resigned June 1, 1913, and has entered private practice in Syracuse.
- DYNAN, DR. NICHOLAS J., Senior Assistant Physician at Government Hospital for the Insane at Washington, D. C., left the service May 14, 1913.
- ECKERDT, DR. A. C., Pathologist and Assistant Physician at Springfield State Hospital at Sykesville, Md., has resigned to accept a similar position at Montana State Hospital for the Insane at Warm Springs.
- EVANS, DR. MARY L., Assistant Physician at New Jersey State Hospital at Trenton, resigned and has entered private institution work in Portland, Ore.
- EVANS, DR. E. E., appointed Assistant Physician at Hospital No. 1 at Fulton, Mo.
- FELL, DR. E. W., appointed Assistant Physician at Elgin State Hospital at Elgin, Ill.
- FOSTER, DR. R. H., appointed Second Assistant Physician at State Hospital for the Insane at Norfolk, Neb.
- FREEMAN, DR. GEORGE F., Assistant Superintendent of State Hospital for Inebriates at Willmar, Minn., promoted to be Superintendent.
- FREEMEL, DR. H. J., Assistant Physician at Chicago State Hospital at Dunning, Ill., transferred to Kankakee State Hospital at Kankakee, Ill., June 18, 1913.
- FRISCH, DR. ISAAC C., Assistant Physician at Chicago State Hospital at Dunning, Ill., transferred to Chester State Hospital at Menard, Ill.
- FUNKHOUSER, DR. EDGAR B., Assistant Physician at New Jersey State Hospital at Trenton, in charge of the male service, recently spent six months leave of absence in Munich, Vienna, and Zurich.
- GOODNER, DR. RALPH A., appointed Superintendent of Anna State Hospital at Anna, Ill.
- GRAU, DR. LEROY C., Medical Interne at Manhattan State Hospital at Ward's Island, N. Y., resigned May 25, 1913.
- GRAY, DR. H. L., appointed Assistant Physician at West Virginia Hospital for the Insane at Weston.
- GREGORY, DR. HUGH S., appointed Medical Interne at St. Lawrence State Hospital at Ogdensburg, N. Y., June 2, 1913.
- GUTTERY, DR. W. D., appointed Superintendent of State Hospital for the Insane at Norfolk, Neb.
- HAMMOND, DR. EUGENE H., appointed Medical Interne at Utica State Hospital at Utica, N. Y., April 15, 1913.
- HAMMOND, DR. FREDERICK S., Pathologist at New Jersey State Hospital at Trenton has been granted a year's leave of absence for study abroad. He has been working in the laboratory of the Munich Psychiatric Clinic under Prof. Spielmeier and will also spend some time with Prof. Alzheimer at Breslau.
- HARDT, DR. H. G., Superintendent of Lincoln State Colony and School, resigned August 10, 1913, and has entered private practice in Chicago.
- HASSALL, DR. JAMES C., Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to be Junior Assistant Physician April 1, 1913.
- HENNING, DR. R. E., Assistant Physician at State Hospital for Inebriates at Willmar, Minn., promoted to be Assistant Superintendent.
- HERSIO, DR. WILLIAM, Assistant Physician at Chester State Hospital at Menard, Ill., resigned.
- JOHNSON, DR. ANDREW, Superintendent of Norfolk State Hospital at Norfolk, Neb., resigned.
- JONES, DR. KENNETH B., Junior Assistant Physician at New Jersey State Hospital at Trenton, appointed Chief Resident Physician at City Detention Hospital at Baltimore, Md.
- KATNE, DR. W. J., Assistant Physician at Protestant Hospital for the Insane at Montreal, Quebec, resigned June 8, 1913.
- KALLOCH, DR. D., Assistant Physician at Elgin State Hospital at Elgin, Ill., resigned.

- KATZEN-ELLENBOGEN, DR. EDWIN, formerly of Danvers State Hospital at Danvers, Mass., and recently Psychologist at State Village for Epileptics at Skillman, N. J., appointed Special Research Worker and Psychologist at New Jersey State Hospital at Trenton.
- KEHOE, DR. HENRY C., appointed Superintendent of Kentucky Institute for Feeble-minded.
- KELL, DR. RALPH E., Superintendent of Chester County Insane Hospital at Embreeville, Pa., resigned August 1, 1913.
- KELLEY, DR. PATRICK M., appointed Superintendent of Kankakee State Hospital at Kankakee, Ill.
- KELLOCH, DR. E. J., Assistant Physician at Elgin State Hospital at Elgin, Ill., resigned.
- KIER, DR. RAYMOND FRANCIS CHARLES, First Assistant Physician at Dannemora State Hospital at Dannemora, N. Y., appointed Superintendent of Matteawan State Hospital at Fishkill Landing, N. Y.
- KNIGHT, DR. Z. T., appointed Assistant Physician at Hospital No. 1 at Fulton, Mo.
- KUNSTLER, DR. MAX, Junior Assistant Physician at Craig Colony at Sonyea, N. Y., resigned August 1, 1913.
- LANAHAN, DR. WILLIAM J., appointed Dental Interne at Government Hospital for the Insane at Washington, D. C., September 8, 1913.
- LAUTHLIN, DR. CARL A., appointed Assistant Physician at Woodcroft at Pueblo, Col.
- LEAVITT, DR. WILLIAM J., Assistant Physician at Utica State Hospital at Utica, N. Y., transferred to Central Islip State Hospital at Central Islip, L. I., July 1, 1913.
- LEININGER, DR. GEORGE, appointed Superintendent of Chicago State Hospital at Joliet, Ill., April 5, 1913.
- LEONARD, DR. THOMAS, appointed Superintendent of Lincoln State Colony and School at Lincoln, Ill.
- LEVIN, DR. HYMAN, appointed Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., April, 1913.
- LIEUALLEN, DR. R. O., appointed Assistant Physician at State Hospital No. 2 at St. Joseph, Mo.
- LIND, DR. JOHN E., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., May 26, 1913.
- LOUGHRAN, DR. JAMES J., Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned August 31, 1913.
- LUNDELL, DR. NILS O., appointed Medical Interne at Manhattan State Hospital at Ward's Island, N. Y., August 24, 1913.
- MCGAFFIN, DR. CHARLES G., formerly Pathologist at Taunton State Hospital at Taunton, Mass., appointed Assistant Physician (Pathologist) at Kings Park State Hospital at Kings Park, N. Y., August 1, 1913.
- McLAIN, DR. T., Assistant Physician at Peoria State Hospital at Peoria, Ill., transferred to Jacksonville State Hospital at Jacksonville, Ill.
- McNEIL, DR. J. W., appointed Superintendent of Provincial Hospital for Insane at Battleford, Saskatchewan.
- McNERNEY, DR. WILLIAM J., appointed Medical Interne at Manhattan State Hospital at Ward's Island, N. Y., April 6, 1913.
- MACDOWELL, DR. EDITH, appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., August 26, 1913.
- MADE, DR. C. W., Assistant Physician at Pontiac State Hospital at Pontiac, Mich., appointed Assistant Physician at Agnew State Hospital at Agnew, Cal., July 24, 1913.
- MAHONEY, DR. WILLIAM J., Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., resigned June 1, 1913, and has entered private practice in Syracuse.
- MAJOR, DR. HERMAN S., appointed Assistant Physician at Hospital No. 1 at Fulton, Mo.
- MANOWE, DR. JAMES HARVEY, Superintendent of West Virginia Hospital for the Insane at Weston from 1885 to 1890, died at his home in Kingwood, W. Va., March 20, 1913, aged 91.

- MILLER, DR. F. B. E., appointed Medical Night Officer with rank as Third Assistant at Cherokee State Hospital at Cherokee, Iowa, September 18, 1913.
- MOENCH, DR. GERHARD L., Assistant Physician at Manhattan State Hospital at Ward's Island, N. Y., resigned August 23, 1913.
- MURPHY, DR. JOHN P. H., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., April 8, 1913.
- NAIR, DR. BELLE P., appointed Women's Physician at Northern Hospital for Insane at Oshkosh, Wis.
- NASE, DR. P., appointed Assistant Physician at Protestant Hospital for the Insane at Montreal, Quebec, June 8, 1913.
- NORRIS, DR. FRANK P., Alienist of the Illinois State Board of Administration, resigned September 30, 1913, and will enter practice in Springfield.
- O'NEIL, DR. D. G., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., June 17, 1913.
- ORLMACHER, DR. JOSEPH C., Pathologist at Independence State Hospital at Independence, Iowa, appointed Second Assistant Physician at Clarinda State Hospital at Clarinda, Iowa.
- PAFFARD, DR. HOWARD T., Medical Interne at Kings Park State Hospital at Kings Park, N. Y., died at his home in Southport, Conn., May 1, 1913.
- PARKER, DR. RAY, appointed Assistant Physician at Dixmont Hospital for the Insane at Dixmont, Pa.
- PEARCE, DR. LOUISE, Interne at Henry Phipps Psychiatric Clinic at Baltimore, Md., appointed Assistant to Dr. Simon Flexner at the Rockefeller Institute for Medical Research.
- PETTIT, DR. J. G., Assistant Physician at West Virginia Hospital for the Insane at Weston, resigned.
- PICOT, DR. L. J., Superintendent of State Hospital at Raleigh, N. C., resigned and has resumed private practice in Littleton.
- POSEY, DR. OLANDO J., Medical Interne at Government Hospital for the Insane at Washington, D. C., resigned June 2, 1913.
- REEVE, DR. GEORGE H., appointed Medical Interne at Willard State Hospital at Willard, N. Y., resigned September 15, 1913, to accept a similar position at Government Hospital for the Insane at Washington, D. C.
- RICHARDS, DR. JOHN S., appointed Medical Interne at Manhattan State Hospital at Ward's Island, N. Y., September 4, 1913.
- RIDOUT, DR. LILLA, formerly Assistant Physician at New Jersey State Hospital at Trenton, reappointed.
- ROBERT, DR. HAROLD, appointed Medical Interne at Dannemora State Hospital at Dannemora, N. Y.
- ROSS, DR. JOHN R., Senior Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., appointed First Assistant Physician at Dannemora State Hospital at Dannemora, N. Y.
- RUNYON, DR. WILLIAM A., Second Assistant Physician at Clarinda State Hospital at Clarinda, Iowa, appointed Assistant Physician at Iowa Sanatorium for the Treatment of Tuberculosis at Oakdale.
- SANDY, DR. WILLIAM C., Assistant Physician at New Jersey State Hospital at Trenton, appointed Assistant Physician at Kings Park State Hospital at Kings Park, N. Y., February 1, 1913.
- SCRUTCHFIELD, DR. G. E., appointed Superintendent of State Hospital No. 4 at Farmington, Mo.
- SEARCY, DR. JAMES T., Superintendent of Alabama Insane Hospitals at Tuscaloosa, elected Vice-President of American Sociologic Congress at its meeting in Birmingham, April 24, 1913.
- SELDEN, DR. CHARLES, Clinical Assistant at Manhattan State Hospital at Ward's Island, N. Y., resigned June 4, 1913.
- SHAW, DR. ARTHUR L., Junior Assistant Physician at Craig Colony at Sonyea, N. Y., promoted to be Third Assistant Physician May 1, 1913.
- SHOCKLEY, DR. FRANCIS M., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., September 1, 1913.

- SIGNOR, DR. GEORGE C., appointed Superintendent of Eastern Pennsylvania Institution for Feeble-minded and Epileptics at Spring City.
- SIMCOE, DR. CHARLES B., appointed Assistant Physician at Hospital No. 3 at Nevada, Mo.
- SKVERSKY, DR. ABRAHAM, appointed Clinical Assistant at Manhattan State Hospital at Ward's Island, N. Y., September 10, 1913.
- SLEYSTER, DR. ROCK, Physician to Wisconsin State Prison at Waupun, appointed Superintendent of the new Hospital for Criminal Insane nearing completion at Waupun.
- SMITH, DR. H. J., Assistant Superintendent at Watertown State Hospital at Watertown, Ill., transferred to Chicago State Hospital at Dunning, Ill., April 17, 1913.
- STEVENS, DR. FRANK, First Assistant Physician at Mt. Pleasant State Hospital at Mt. Pleasant, Iowa, has entered private practice in Colorado Springs, Col.
- STEVENSON, DR. W. W., Resident Physician at Mercer (general) Hospital at Trenton, N. J., appointed Interne at New Jersey State Hospital at Trenton.
- STEWART, DR. R. A., appointed First Assistant Physician at Mt. Pleasant State Hospital at Mt. Pleasant, Iowa.
- STONE, DR. G. J., Medical Night Officer with rank as Third Assistant at Cherokee State Hospital at Cherokee, Iowa, resigned and has entered private practice in Virginia.
- SUMMERS, DR. WILLIAM R., appointed Assistant Physician at Hospital No. 3 at Nevada, Mo.
- TOMLINSON, DR. HARRY A., Superintendent of State Hospital for Inebriates at Willmar, Minn., died May 30, 1913, from cerebral hemorrhage, aged 57.
- TOWNE, DR. CLARA HARRISON, Director in Psychology at Lincoln State School and Colony at Lincoln, Ill., has gone to Europe.
- TREADWAY, DR. WALTER, Assistant Physician at Jacksonville State Hospital at Jacksonville, Ill., resigned and has entered the U. S. P. H. service.
- TRENKLE, DR. HENRY L., appointed Second Assistant Physician at Pontiac State Hospital at Pontiac, Mich., August 12, 1913.
- TROWBRIDGE, DR. E. H., Assistant Physician at State Hospital No. 2 at St. Joseph, Mo., appointed Assistant Superintendent of Minnesota School for Feeble-minded and Colony for Epileptics at Faribault.
- TRYON, DR. GENEVA, Assistant Physician at Pontiac State Hospital at Pontiac, Mich., resigned July 1, 1913.
- VANDIVERT, DR. A. H., Assistant Physician at State Hospital No. 2 at St. Joseph, Mo., resigned.
- WENDER, DR. LOUIS, appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., August 25, 1913.
- WILES, FRANK MERO, Assistant Physician at Central Indiana State Hospital at Indianapolis for 23 years, died at St. Vincent's Hospital in that city July 7, 1913, aged 56.
- WILGUS, DR. SIDNEY D., Superintendent of Kankakee State Hospital at Kankakee, Ill., resigned and has purchased the Jenks Sanitarium at Rockford from the widow of Dr. Jenks.
- WOOLSEY, DR. C. L., appointed Superintendent of Hospital No. 2 at St. Joseph, Mo.
- WORTHING, DR. HARRY J., appointed Medical Interne at St. Lawrence State Hospital at Ogdensburg, N. Y., June 12, 1913.
- ZIMMERMAN, DR. ROBERT F., appointed Medical Interne at Utica State Hospital at Utica, N. Y., July 1, 1913.



AMERICAN JOURNAL OF INSANITY

INSANITY, OTHER THAN PARESIS, IN LOCOMOTOR ATAXIA *

BY CHARLES W. BURR, M. D.,

Professor of Mental Diseases, University of Pennsylvania, Philadelphia, Pa.

I think that most of us, in our routine work, when we see an insane person suffering with locomotor ataxia, are prone, unless we are on guard, to make a diagnosis of paresis without taking the, at the time, seemingly unnecessary trouble of making an exhaustive study of the mental symptoms present: I am sure that when we are told the insanity has been of long duration we sometimes jump to the diagnosis of paresis even more hurriedly. Haste in diagnosis is, of course, always inexcusable but so closely are paresis and tabes associated together in our minds that we are often subconsciously prevented from thinking of other possibilities. The purpose of this paper is to emphasize the fact that tabes does not protect from any type of insanity and that all types may occur in ataxic persons.

When we remember both diseases arise from the same causes and that the morbid changes are identical in both, the only difference being the location of the lesion, the number of tabetics who become paretic is smaller than one would expect: indeed a very large number of them pass through life showing no mental symptoms of any kind. It is no uncommon thing to find men who have had locomotor ataxia for many years filling positions requiring mental vigor. We all have seen physicians, judges, and business men who were entirely sane even when the ataxia was so bad that they could not walk unaided. The poet Heine did some excellent thinking when he was "stretched upon his mattress

* Read at the meeting of the Philadelphia Psychiatric Society, January 10, 1913.

grave." Barring paresis, then, locomotor ataxia does not increase the likelihood of insanity and even paresis occurs less frequently than one would expect. When we remember how common a disease tabes is and that a very large number of tabetics are men who have been very heavy drinkers and, indeed, given to excess of all kinds in early maturity, excesses which themselves are prone to excite insanity, the relative infrequency of tabetics in hospitals for the insane is very noticeable.

The following cases illustrate some of the types of insanity, apart from paresis, which commonly occur in tabes. I have purposely avoided giving long detailed case histories and have mentioned only the salient psychical symptoms. As to the diagnosis of tabes I have taken as the test a history of pain, the presence of Argyll-Robertson pupils, the absence of knee jerks, and the presence of some though not necessarily much ataxia. It is important in making a diagnosis not to forget that chronic alcoholic multiple neuritis may simulate tabes and hence lead to error, lead to mistaking an alcoholic insanity for insanity plus tabes.

Case I is an illustration of senile insanity occurring in a tabetic. The patient was a negro woman of mixed blood who was admitted to Blockley, May 17, 1907. When 49 years old marked symptoms of locomotor ataxia were discovered when she went to a city hospital for treatment for rheumatic pains. How long the disease had existed before she received treatment could not be discovered. No mental symptoms appeared until 12 years later when she was 62 years old. She then suddenly became destructive. Whether there had been a prodromal period is unknown though it is extremely probable. She heard voices calling her evil names, became excited, talked constantly, ceased to sleep, and ate very little. She said that it was not she who was talking but someone who controlled her. A few days later she was brought to the hospital wildly excited, cursing, swearing, threatening to kill and complaining that someone was controlling her thought and speech. During the entire time she was in the hospital she always used the third person in answering a question and sometimes would interrupt the answer to swear at the devils whom she said had used her tongue to answer falsely.

After a time she became less violent but continued loquacious and quite profane. In a few days she became so weak that she was bedridden and her rage was impotent. She carried on conversations with imaginary persons and heard God talking to her. At times she was very grandiose. Still later she was able to talk for a few minutes with some coherency about incidents of her early life but was delusional almost to the end. She was possessed by four devils who had entered into her and who fought among themselves about her. Her habits were filthy and she was entirely

shameless. She had all the classical signs of tabes and also chronic valvular heart disease and chronic Bright's. She became more and more demented and physically weaker and weaker, and finally died of heart disease one month after the onset of mental symptoms. It would be more accurate to say that the heart presented more serious signs of organic disease than any other organ rather than that she died from heart disease. Her whole cardio-vascular-renal system was seriously affected and the stress laid upon it by her mental and physical violence, was extreme. Her death therefore was not purely and wholly cardiac.

There is not room to give in detail all the symptoms of her case. It must suffice to say that after suffering from tabes for at least 13 years she developed a period of mania which rapidly passed into a dementia but not paresis. No one would claim that paresis could run its whole course in a few weeks. The morbid anatomy of the disease makes that impossible. There were days during her illness when, if one had disregarded her previous history and had had no foreknowledge of what the future had in store for her, paresis would have been diagnosed.

Case II I have never satisfactorily classified. I first saw him in 1894. He then had had tabes at least three years. He presented no mental symptoms of any kind. After a few months I lost sight of him and did not see him again until 1900 when he was admitted to Blockley. After he had been in the nervous wards for a few days he became quarrelsome and abusive. He heard voices calling him vile names and said the nurses and patients were jealous of him because he was a poet and knew more than they. According to his history mental symptoms had only appeared a short time before his admission. He was transferred to the insane department while wildly excited and violent. He soon quieted down but at times would suddenly begin to fight other patients. He constantly accused patients and attendants of calling him names and gave that as his reason for striking them. He had periods of depression, of elation, and of seeming mental health. Though often persecutory he was never self-accusatory. During the last three years though his lucidity has varied he has had no period of depression. On the contrary he has been pretty constantly elated but sometimes his emotional tone has been normal. During his mental illness there have been times when, judging him only by the symptoms present at the moment, one would say he had paresis, other times when he presented the symptoms of mania, others when he had depression without delusions, others depression with delusions of persecution, never of self-accusation, and still other times when he seemed mentally almost normal. The duration of any one period has varied from a week to several months.

At my last visit to him, in January, 1913, he recognized me as soon as I came in the room, though he had not seen me for three years called me by name, remembered when and where he had first seen me, gave an accurate account of how his spinal cord trouble came on. So far no one would have suspected any mental failure at all. His manner was quiet, his articulation good, his conversation entirely rational. He realized his physical

disabilities. His memory was excellent. But so soon as I asked him whether he was wealthy he answered that he was worth millions and proceeded quietly to tell how much he was going to give each of his friends. I was to have one hundred millions for my hospital. The nurse was to take a trip to Florida. All this was said quietly and in an entirely matter of fact way. To-day, then, he presents the picture of paresis, but when taking into consideration his whole mental history during the twelve and a half years he has been insane, I do not feel justified in such a diagnosis, though how to label him I confess I do not know. I have thought sometimes that he is a victim of two insanities, paresis and manic-depressive insanity, and that his periods of great mental improvement were lucid intervals, but it is hard to believe that the lucid intervals of paresis and the healthy periods of manic-depressive insanity should always be synchronous, yet if they were not synchronous he would not have periods of lucidity, for even assuming that one disease cleared up for a time, the presence of the other would cause symptoms.

Case III is an example of a man who certainly was congenitally paranoid, who has been mentally affected by alcohol and who has had tabs for years. His mental state is due to his congenital twist, plus alcoholic excess, and is in no way dependent upon his tabs.

His father was an officer in the Austrian army. The patient had a good education but was a wild boy. When he was 19 years old, and already a drinker, he had some sort of acute mental trouble and attempted suicide. He came to New York on a training ship of the Austrian service when about 26 years old, but not being content to submit to the discipline, deserted and went West. As a boy he was opinionated, egotistic, overbearing and had very exaggerated ideas of his ability. Soon after he came to America he heard of his mother's death, became depressed, drank heavily, and for the second time attempted suicide. He learned lithography somehow and somewhere. There is a long period of his life that his brother, who gave me his history, can tell me nothing about.

When admitted at the age of 34 (October, 1888), he had many delusions. He believed that enemies were persecuting him by exciting him with electricity. At another time he thought people were living in his pockets. He was always grandiose, always persecuted, and always superior to his persecutors. He argued by the hour. He had, during the earlier years of his stay in the hospital, a few periods lasting only a day or two in which he refused to get out of bed, would not even move, would not speak nor eat. He claimed that he was unconscious in these attacks, or rather denied that he had any knowledge of them but behaved in them as if he were fully conscious. They were not attacks of catalepsy nor catatonic stupor. I believe they were feigned.

For several years after his admission he used to amuse himself by drawing portraits of doctors and patients but has not done any such work for years. His pictures have distinct artistic merit. Pretty soon he quieted down to the discipline of the institution. He never had any clearly defined

idea of a distinct plot against him, no belief that there was a thought-out conspiracy to injure him, but simply a fixed idea that somebody or some people were trying in some way to injure him. He has worked in the storeroom, checking off supplies sent to the wards, for several years and does his work well. In January, 1913, 20 years after his admission, his condition is as follows. His gait is somewhat but not very markedly ataxic, and his station is poor. His knee jerks are absent. His pupils are very small and do not react to light but do with accommodation. There is scarcely any ataxia in the hands. Pains continue in his legs but, he says, they are nothing like as severe as they were years ago. He has no crises. He has some slowness in micturition. His *tabes* has not progressed in the years I have known him. Mentally the most striking thing is his suspiciousness. He regards no one as his friend and every one whom he meets in the hospital as a possible enemy. He is friendly to a sister in Vienna with whom he corresponds. He denies all mental illness yet makes no attempt to regain his liberty. His memory is excellent. He acts as if he had delusions of persecution but will not talk about them. In a quiet way he shows his feeling of superiority to the other patients and, as a fact, he is superior to most of them in heredity, education and intellectual power. Of course in the environment in which he lives he is the man with one eye in the country of blind men. Though he can do his assigned work in the hospital he could not work outside, not on account of dementia, for he is not demented, but because he would be constantly quarreling and his suspiciousness would soon lead him to a breach of the peace.

Case IV is an example of alcoholic delusional insanity in a tabetic. He was admitted for the first time in August, 1907. He had had locomotor ataxia for some years and was a very heavy drinker. He began about a month before admission to accuse his wife of infidelity. He would quarrel with her and then forget all about it. His sexual desire was far greater than his power. He was discharged after some months much improved, but a few months later was brought back because he began to drink almost as soon as he left the hospital and all his symptoms returned. He believed that his wife chloroformed him in order that she could entertain other men during his sleep.

He began to quiet down soon after his second admission to the hospital and to do a few chores around the ward. His delusion about his wife is still present (January, 1913) but he seldom talks about it. He is elated and at the same time aggressive. He is not violent at any time but always ill-natured. He is lucid in talking on general subjects but would be unable to take care of himself if permitted to go out in the world and would injure his wife if he lived with her. His mental state is not in any way dependent upon his *tabes* but is the direct result of excessive drinking for years in a man congenitally weak.

Case V is of interest by way of contrast: it differs entirely from the others in that it is an instance of a man already insane in whom *tabes* developed later. He had a chancre some time between his twentieth and thirtieth year. When 37 years old he had, I am informed by the physician

who treated him, a very serious attack of typhoid fever. He was delirious throughout its course, began to be eccentric immediately after he resumed his place in the world, a few months after the fever ceased, and since then, a period of 20 years, has never been mentally normal. He had no sign of *tabes* a few years after the typhoid but when it began to develop is undiscoverable. Soon after he returned to work (he was a skilled mechanic in a trade requiring great technical skill and education), following the fever, he commenced to abuse his wife and accused her of infidelity. He had at the same time very curious ideas about health, and made his children take long walks before sunrise and eat strange things. After a few months he left his home, deserting his wife and children, and became more or less a wanderer. For years he held no communication with his family. They, however, did succeed in keeping some sort of oversight over him and tell me that he always worked though he never stayed long in one place. He became unsocial and wherever he lived was regarded as queer. He would at times go on sprees but apparently never got into difficulties with the police, though of this I am not certain. Six years ago his son met him. At first the father denied paternity but later became at least friendly and has so continued. He seems now to admit his relationship. During all these years his attitude toward his wife has continued the same—she was unfaithful. His reasons for his belief are based on hallucinations of sight and hearing. Several years ago he began to be very forgetful. He ceased to wander and has done light work in a country town for the last five years. During the last three years he has not been known to drink by his neighbors. A few months ago he began to talk about a vile odor and this, coupled with his increasing loss of memory and consequent inability to work, caused some acquaintances to send him to a hospital where I saw him.

He was somewhat ataxic in gait. His pupils were very small and did not react to light though they did to accommodation. His knee jerks were absent. His station was not good and yet not very bad. His articulation was good. He complained bitterly of the vile odor from his feet. During the night he had visual hallucinations of a man and woman in his room. The hallucinations were sexual. His memory was very bad and he knew it was bad. He related the story of leaving his wife without any show of emotion and regarded the whole matter as commonplace. He did not know where he was. He has marked arterial sclerosis and his urine contains a few hyaline casts and a trace of albumen.

I think the explanation of his case is that he was congenitally unsound or rather that he was born with a strong predisposition to insanity, that syphilis made him less able to withstand the strain of typhoid, that alcohol gave the bent to his delusions and hallucinations and that, finally, syphilis, years later, caused his *tabes*, and that now premature senility has set in. It is no uncommon thing for cases of mental disease which endure over a period of years and show a different clinical picture at different times to be really mixed cases, to be different types of insanity having different exciting causes acting on the same personality.

HORACE ON THE MINOR PSYCHOSES.

SATIRE 3. BOOK II.

EDITED AND TRANSLATED BY CHAS. L. DANA, M. D., LL. D.

INTRODUCTION.

Horace wrote this satire about A. U. C. 722, when he was 33 years of age. He was at his country place in the Sabine Valley at the time. He is there interviewed by a certain Damasippus, a bankrupt dealer in antiques, and a convert to the Stoic philosophy. He is a historic character and is referred to by Cicero who wants him to take some unsatisfactory statues off his hands. Damasippus tells the story of his early experiences in life and how he came to be converted to the philosophy of the Stoics by the master Stertinius.

Then the argument is taken up by Stertinius, who proceeds to try and prove that everyone is mad who is not wise, and inferentially that no one is wise who is not a Stoic.

Five different ways by which man shows his *insania* are then described: greed, ambition, luxury, lust, and superstition.

It is easy to see that Horace is himself talking, now and then, through the mouth of his instructor. By the clever device of making Stertinius do the philosophizing, the poet is able to say extravagant things, thus making Stoicism seem absurd, and yet speak in such a way as to show that there is much real truth and soberness in the long argument of his sermon.

In the Roman days the preacher who was calling sinners to repentance had very little to appeal to except the good sense and the traditions of the people. He could not offer a reward of future happiness, or threaten with hell-fire. The people propitiated the gods not by good deeds but with sacrifices. Neglect of the temples and of the altars, not misconduct, was displeasing to them. So Horace, having no ecclesiastical weapons in attacking the sins of his day, appeals to the reason and pride of his hearers. He says that vice is the sign of a sick mind, and the vicious are *amens*, *demens*, *insanus*, etc. As no one wants to be thought

defective mentally his appeal should have had some force. At any rate he uses the arguments for right living which to-day are presented by agencies for mental hygiene.

It is the point of view of some ethical preachers now that wickedness is due to weak, abnormal or morbid brains, "wickedness is madness." "Qui scleratus et furiosus erit," said Horace 2000 years ago.

During the argument the speakers use the words usually employed in Roman literature to indicate various phases of mental unsoundness, but it is easy to see from the context that they are employed only half seriously, just as we say: "Well, you must be crazy!" to indicate an extravagant or foolish act.

Horace sometimes uses the term "insanus" to indicate certain manias or obsessions. He describes a kind of morbid fear of obstacles, also the reckless impulsion to do foolish and dangerous acts. Those who act under the impulses due to ignorance, viciousness and folly are, he says, "mad." Those are "sick of mind" who are driven on by selfish ambition, greed, sensuous indulgences or are slaves to passion and to gloomy superstitions. Such persons are characterized by the terms "insanus," "vesanus," "delirus," "furiosus," "amens," "commotus," "non incolume caput." They are all crazy because they are so extravagant and foolish but it does not mean that they are insane or in need of a guardian, though he makes his Stoic philosopher intimate this, just to satirize the extravagance of the rhetorician himself. To-day we would say that some of the "*cunctum vulgus*" are bad, some foolish and many obsessed or psychasthenic. Only the most advanced school of psychiatrists and criminologists would say with Stertinius that almost all of the world is suffering from some kind of major or minor psychosis.

A great deal of pains is taken by Horace to show up the covetous and miserly. These people seem to the poet to be the most crazy of all. Horace elsewhere and often attacks this vice with a zeal which we do not perhaps appreciate to-day except in so far as it refers to the craze for acquiring wealth. He attacks this craze also but emphasizes more the evils of stinginess, of hoarding, and of not spending wisely. Misers must have been numerous in Rome. If Horace lived now I expect he would give the largest part of his medicine for madness to those who are fiercely seeking and foolishly spending money.

He expresses the idea of mental unsoundness in many circumlocutions which have often a modern and English equivalent, "non incolume caput," an unsound head, "non penes te," not in your senses, "non tutae mentis," of unsound mind, "putidius multo cerebrum," a very addled brain, "commotus menti," a disturbed mind.

Horace does not show any technical knowledge of insanity. His terms for madness are more or less interchangeable. Thus "*stultus*," "*excors*," "*desipiens*," mean foolish and stupid or absurd. *Amens* indicates an acute and *demens* a more chronic and serious form of craziness. Orestes and Agave were called *demens*. *Furor* and *furiosus* indicate madness with excitement. *Insanus* is his most common term and includes mental unsoundness of all kinds and degrees. He has no instance of acute mania; but his severest type of madness is one in which "Bellona rejoicing in blood thunders about the head" of the selfishly ambitious. "Hunc circumtonuit gaudens Bellona cruentis." *Delirus* may mean only silly or obsessed like the unmusical man who collects harps.

There is no mania or melancholia, or dementing psychosis in the Satire.

A qualitative "constitutional inferiority" might be suggested as characterizing Damasippus, on which is engrafted a paranoid trend, as regards the philosophy of the Stoic.

Ajax is referred to in terms which indicate him to be a case of homicidal hallucinatory paranoia, and Agamemnon is presented as an illustration of morbid religious fanaticism.

The sober old Freedman who ran about crying to the gods to make him immortal must have been a senile dement, though Horace calls him "crazed by superstition."

Finally Horace shows the lightness with which he regards all these qualifications when he asks at the close,

"Qua me stultitia . . . insanire pertas?"

"What is my particular craze?"

The text of the satire is not exciting reading and the moralities are rather obvious, but the work is interspersed with stories, local and historical references, proverbs, argumentation, puns, ingenious turns of thought and expression, so that it holds the attention. The illustrations are sometimes very local and require knowledge of the daily life in Rome to appreciate them. A certain actor, for

example, is referred to who had come on the stage so drunk that he fell asleep and could not be aroused to speak his part. This was an incident amusing and familiar to Horace's audience.

The satire has been somewhat artificially subdivided by me in order to show more clearly the successive arrangement of topics.

No one has ever translated this satire successfully into verse. I have not tried it but have endeavored to tell this story simply and in as modern a way as possible. For Horace is very modern, not averse to slang or even puns. A Satire was for him a miscellaneous mixture, a literary salad, a kind of vaudeville in hexameters, but carefully done, the work of an artist; and this third Satire is of his best works.

PERSONS OF THE SATIRE.

QUINTUS HORATIUS FLACCUS, who has just achieved literary and economic success, and being naturally indolent, has begun to let up on his work.

DAMASIPPUS, a bankrupt dealer in antiques, who has passed from a suicidal depression, to a manic activity in behalf of Stoicism.

STERTINIUS, a Stoic philosopher who talks through the mouth of Damasippus.

PERSONS OF THE EPISODES.

Agamemnon, King of the Greeks.

Staberius, a lover of money.

Cratinus, physician.

Opimius, a miser.

Nomentanus, a dissolute spendthrift.

Physician to Opimius.

An old Freedman.

Oppidius, a man of wealth.

SCENE.

The Villa of Horace on the Digentia River in the Sabine Valley, about thirty miles north of Rome. Horace had only recently received this estate from his patron, Maecenas. He has left Rome and gone to his estate in order to avoid the noise and excitement of the Saturnalia, or December festivals.

Damasippus. You write so rarely, Horace, that you do not call for paper four times a year. You are irritated over what you have already written, and you feel so kindly towards sleep and wine that you write nothing of any note. What is going to happen? You came here to escape the noise of the Saturnalia, so being now here and sober, give us something worthy of your promises. Begin.

Horace. There is nothing to say. It is of no use to find fault with my pens or to beat my head against my undeserving walls, built when gods and poets were angry.

Damasippus. But you had the look of one intending to do many wonderful things when you obtained your leisure and the warm roof of this little villa; besides, why did you bring along such good companions as Plato and Menander, Eupolis and Archilochus? Do you expect to avoid envy by shirking your work? Men will only despise you for such a course. It is nothing but sloth. Avoid the Siren or you will have to give up all you have achieved in your better days.

Horace. May the gods reward you with a good barber, Damasippus, for your wise advice—but how did you come to know me so well?

HOW DAMASIPPUS BECAME A STOIC.

Damasippus. After I became bankrupt on the exchange, I began to look after other people's business, having none of my own. Before that time I loved to hunt for bronze vessels so antique that the ingenious Sisyphus might have washed in them; to learn what vase was carved clumsily and what too coarsely. Through my skill I could put value on a statue worth one hundred thousand sesterces (\$5000). I was so expert in buying gardens and fine houses to advantage, that the crowd called me the favorite of Mercury.

Horace. I know it and I wonder how you got rid of that mania.

Damasippus. A new one surprised me out of the old, just as a pain in the side or the head shifts to the heart, or as a lethargy turns into a frenzy and the patient falls to fighting the doctor.

Horace. Provided you don't do anything like that here, you may have it all your own way.

HOW ALL BUT THE WISE ARE MAD.

Damasippus. My good friend, you need not deceive yourself. You and all fools, I may say, are mad, if there is any truth in what Stertinius says. It was from him that I docilely wrote down the wonderful precepts of his philosophy at a time when, having consoled me, he bid me cultivate a learned beard and return in good spirits from the bridge of Fabricius. For, my affairs hav-

ing gone badly, I was preparing to throw myself, with covered head, into the river when Stertinius appeared at my side. "Beware," he said, "of doing anything unworthy of yourself. A false shame troubles you. Why should you mind being called mad, when all are so? For what is madness? Let me tell you, and if you then think you are any more disordered than others, I will not say a word against your bravely killing yourself."

The school of Chrysippus pronounce those mad who are blinded by wickedness, foolishness and ignorance of true philosophy. Thus all are mad, from the highest to the lowest, except the wise. Now hear why all who call you crazy are just as crazy as yourself. As in a wide wood where all go astray, though all in different directions, one wandering to the left, another to the right, so it is with fools. And you, if in error, are no more so than those who laugh at you. It is they also who are "dragging the tail" [being made fun of].

There is one kind of foolish people who are afraid of things which are not at all to be feared. They fear that fires, precipices and rivers may obstruct them as they travel through an open plain. There are others, and no better, who fear nothing at all but rush into the midst of fire and water. The anxious mother, the faithful sister, the father, wife and the relatives cry out: "Here's a deep ditch, here's a steep precipice, take care"; but he does not mind them any more than Fufius, who acted the part of sleeping Ilione while drunk, and fell so fast asleep that when 20,000 people screamed at him "I call thee mother," he did not awake.

THE FOOLISH CREDITOR IS AS MAD AS THE SHIFTY DEBTOR.

Let me show you again how it is that the bulk of mankind are insane in some way or other. You, Damasippus, are crazy to buy statues and vases, but is the man who gives you credit of sound mind? Suppose I say, "take this money and you need never repay me," would I not seem mad and would you not seem more so if you refused such bounty of a favoring Mercury? One may make an entry in his books of the thousand dollars he has loaned to a bad debtor like Nerius; he may add such further pledges as the subtle lawyer Cicuta provides, and take a thousand other forms of security; nevertheless the debtor, who has nothing to lose, will,

like a Proteus, elude these engagements. If you sue him at law he only laughs at your misfortunes, and to escape you he becomes a boar, a bird, a stone or a tree. So if to manage an estate badly is a sign of madness, believe me, the brain of the man who took a note from you, Damasippus, is more disordered than your own.

Now listen and compose your togas, everyone who is ambitious or avaricious, extravagant, sensuous, superstitious, or is heated with any other kind of sickness of the mind. Draw near and in proper order; and I will show that you are all mad.

THE MADNESS OF THE MISERLY.

Much the largest dose of medicine must be given to those who are greedy of money. They are almost past cure. Staberius willed that the amount of his fortune be carved upon his tombstone. Unless his heirs did this they were to give two hundred gladiators to the people or serve a banquet, at the discretion of Arrius, of as much corn as all Africa produces. "I have made this will," says Staberius, "and whether it is right or wrong, it is no one's business." ["Do not be an uncle to me."]

Damasippus. What was he thinking about when he willed that his heirs should do such a thing?

Stertinius. It was this: While Staberius lived he believed that poverty was a great crime and he avoided nothing more earnestly; so much so that if he had died poorer by one farthing it would have seemed to him that he was by so much a worse man; for everything: virtue, fame, honor, things human and things sacred bow, he thought, to wealth, and he who amassed it was noble, brave and just.

Damasippus. What! wise also?

Stertinius. Yes; and a king to boot, or anything else, for he believed that the wealth acquired by his talent would always redound to his great honor.

How unlike this man was the Greek Aristippus, who, to lighten the load of his slaves, bade them throw his gold into the desert because encumbered by it they traveled too slowly! Which of these men, do you say, was the madder?

Damasippus. No example works well which solves one question with another.

Stertinius. If a man buys harps and stores them away, not being a student of the harp, or of any of the Muses; if one who is not a shoemaker buys knives and lasts; or one who is not a sailor buys sails for ships, all will justly call him silly and demented. But how does he differ from one who hoards money, not knowing how to use it and afraid to touch it as if it were sacred? If a man continually watch before his granary with a long stick, and not dare, though hungry, to touch the corn, but feeds upon bitter herbs; if one who has thousands of casks of old Falernian wine piled up in his storehouse, yet drinks only stale vinegar; if an old man of eighty sleeps upon straw while his fine bed rots in the chest, a food for worms and moths, he is not called mad, because most men are affected with these kinds of mania. Thou dotard! hateful to the gods, do you guard your money so that your heir, your son or perhaps your freedman may enjoy it later? How much will it take daily from your great fortune to put a little better oil on your salad as well as on your dirty head? If you need so little, why do you lie, rob and steal in every quarter to get more? What! are you quite sane?

INSANITY AND MURDER [HORACE COMES NEAR STRAYING FROM HIS ATTACK ON THE MISERS].

If you begin to attack people with stones and to kill your slaves bought with your own money, even the boys and girls will call you crazy. But if you strangle your wife, or poison your mother [to save expense], are you not also unsound of mind?

You say "no," perhaps, because you act as a Roman [who has power of life and death over his family] and not dramatically like Orestes at Argos when, driven by evil passion, he warmed his dagger in his mother's throat. But what is the difference? Orestes, after the murder, acted as sanely as you, only calling his sister and friends hard words such as his excited temper (*splendida bilis*) compelled. [One concludes that Horace thinks crime is the result of an abnormal mind, either *stultus* or *insanus*.].

THE STORY OF OPIMIUS.

Opimius, poor amidst his treasures of gold, was used on festal days to drink the sorry Veian wine out of a cheap pot, and on common days mere dregs. He was once seized with a deep leth-

argy, so that his heir, thinking him as good as dead, began, quite overjoyed, to run about to lay hold on his keys and rummage his money chests. A trusty physician, a man of ready thought, recovered him by this artifice: He orders a table to be set before him, his bags of money to be poured out, and several persons to come and count it over. Thus he rouses the patient, crying out to him at the same time: "Unless you take care of your coin, your greedy heir will carry it off at once!"

Opimius. "What, while I am alive?"

Physician. "Yes, and if you wish to live, keep awake and follow my advice."

Opimius. "What do you advise me?"

Physician. "Your blood and spirits will fail you, unless your weakening stomach be instantly supported with food and a strengthening cordial. Why do you hesitate? Come, take this ptisane of rice."

Opimius. "What will it cost?"

Physician. "A trifle."

Opimius. "But how much?"

Physician. "A dime."

Opimius. "Dime! Alas! What does it matter whether I die of disease or be ruined by robbers and extortioners?"

AMBITION AND MADNESS.

Servius Oppidius, the possessor of an ancient fortune, divided between his two sons his estate at Canusium, and at death addressed his boys, who were called to his bedside, thus: "Ever since I observed you, Aulus, when a child, you carried your toys and nuts loosely in your bosom, giving or gambling them away; you, Tiberius, were busied in counting over yours, and hiding them carefully in secret places. Thus I have been afraid lest the two extremes of madness should seize you; lest you, Aulus, copy the spendthrift Nomentanus, and you, Tiberius, copy Cicuta. Wherefore, let me conjure you both by the guardian gods of your family, beware you, Aulus, of impairing, and you, Tiberius, of enlarging that estate which your father judges sufficient for you, and which nature limits. I will, moreover, bind you both by oath, not to have the itch of ambition. If either of you become ædile or prætor, may my heaviest curses fall upon you. For would you

be so mad as to consume your goods in giving peas and beans, and such like donations to the people, that you may strut along in the circus, or stand in sculptured brass, though denuded of your paternal lands and money? Aspiring, perhaps, for those applauses which Agrippa receives, and making yourselves ridiculous like a crafty fox who would imitate the generous lion?"

Damasippus. Who, then, is sound in mind?

Stertinius. He who is wise.

Damasippus. And the miser?

Stertinius. He is neither wise nor sane.

Damasippus. But if a man is not a miser, may he still be wise?

Stertinius. By no means.

Damasippus. Explain, Stoic.

Stertinius. I will do so. Suppose that Craterus, the physician, had said: "This man who is ill has no trouble with his heart"—is he then healthy and will he get well? Craterus would say "no"; for the chest or the kidneys may be suffering from some acute disease. Just so this man is neither sordid nor dishonest, and for this let him sacrifice a pig to his propitious gods; but he is extravagant and reckless. Let him also sail for Anticyra, for what difference does it make whether you give away what you possess to scoundrels or never use your property at all?

Stertinius. Let me give another instance of evil ambition: "Why, Agamemnon, have you ordered that no one shall bury Ajax?"

Agamemnon. "I am a king."

Stertinius. "I am only a plebeian and will ask you then no more questions."

Agamemnon. "What I order is just, but if anyone thinks me unjust I will let him speak his mind."

Stertinius. "Will you allow me to converse with you freely, then, in the way of question and answer?"

Agamemnon. "I will."

Stertinius. "Why do you allow Ajax, a hero inferior only to Achilles, to lie rotting above ground?"

Agamemnon. "It is because in his madness he put a thousand sheep to death, asserting that he was killing the great Ulysses, Menelaus and myself."

Stertinius. "When you were at Aulis and offered your sweet daughter as a victim for the altar, and inhumanly sprinkled her head with the salted cake, were you master of your reason?" —

Agamemnon. "I did it to rescue our tempest-bound ships from an adverse port and prudently appease the gods with blood."

Stertinius. "Yes, mad king, with your own child's blood."

Agamemnon. "I did it, yet I was not mad."

Stertinius. "Whoever holds false and confused ideas of what is right or wrong is of disordered mind, whether his misdeeds are done through folly or in passion. Ajax was insane, but when you, with premeditation commit a crime for the sake of empty inscriptions, are you not also? Is your heart pure when it is swollen with a bad ambition? Can a person who sacrifices to the gods his own daughter instead of a useless lamb, be sound of mind? No one will assert it. Alas! when to folly man adds a depraved ambition, we find the worst kind of mad man, and Bellona, rejoicing in cruel deeds, thunders about his head."

LUXURY AND MADNESS.

Now, my friend, come and bring luxury and Nomentanus to the trial, for indeed my reasoning will convince you that those who spend their money in folly and extravagance are also of unsound mind. There was a young man of this type who, as soon as he had received his fortune, ordered the fishmonger, the fruiterer, the fowler, the perfumer and all the impious crowd of Tuscan Street with its buffoons, the poulterer and the tradesmen of the market place to attend on him in the morning. Next day they all appeared, and one of them addressed him. "Whatever we have, it is yours either to-day or to-morrow." The fine youth replied: "You sleep with your boots on amid Lucanian snows so that I may dine on the boar; you sweep fishes from the wintry sea for me to eat. I at my ease am unworthy to possess my wealth. Away with it! A million to you; as much to you; three million to you from whom your wife will run at midnight when I call her." The son of Æsop dissolved in vinegar a pearl taken from the ear of Metella, so that he might be able to say he had swallowed a million at a draught. How is he wiser than if he had thrown it into a common sewer?

be so mad as to consume your goods in giving peas and beans, and such like donations to the people, that you may strut along in the circus, or stand in sculptured brass, though denuded of your paternal lands and money? Aspiring, perhaps, for those applauses which Agrippa receives, and making yourselves ridiculous like a crafty fox who would imitate the generous lion?"

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Quintus Arrius had two sons, a noble pair of brothers, twins in lewdness, frivolity and love of vice; they used to dine on nightingales, for which they paid great sums. To which side shall these wise men go? Shall they be marked with chalk or with charcoal [sound or mad] ?

LOVE AND MADNESS.

The elderly man who loves to make mud pies, to hitch tame mice to a toy wagon, to play odd and even, to ride a long stick, is thought crazy. If I can show you that to fall in love is a more childish thing than this; that to play in the sand as you did when you were three is as foolish as to torture yourself into tears over the love of your mistress, you will perhaps lay aside the insignia of your malady and repent, as the drunkard Polemon did, who was cured of his evil habits by the wholesome discourse of his master [Polemon was an Athenian rake, who was suddenly reformed by hearing Xenocrates.]

If you offer apples to a peevish boy he refuses them. "Take them, my little dear," you say. He refuses; but if you cease to give him any, he cries for them. How does he differ from the lover who has been quarreling with his mistress? He debates with himself: "Shall I call on her or not?" He starts to go to her, though not invited; he hangs about her hated doors. "Shall I go now," he says, "when she has at last invited me, or shall I find some way to end my sorrows? She has refused me, now she invites me. Shall I return? No; not if she begs me." Note what the wise slave said to his master: "Oh, master, what has neither rule nor reason will not be bound by rule or reason." Love has these inherent defects: it is a condition of war and peace by turn. If anyone tries to make those things stable which, like the weather, are unstable, he will not accomplish any more than if he tried to be insane by rule and reason.

When you play the lover's game of pinching apple seeds and are elated if one happens to hit the ceiling, are you wholly yourself? When lisping words of love come babbling from your aged palate, are you not just as silly as the child who builds houses of clay? To this foolishness of love add the bloodshed caused by it; you stir fire with the sword.

Was not Marius, I ask you, mad when he threw himself over a precipice, having just stabbed his mistress Hellas; or will you clear him of the charge of a disordered mind and accuse him of wickedness, using different names to indicate similar things, as is your custom?

SUPERSTITION AND MADNESS.

There was once a sober old freedman who used to run about the streets in the morning with washed hands, and pray: "Grant me, just me alone, immortality!" adding, "What so mighty a matter! it is easy for the gods!" He was sound of sight and hearing but his master would not say the same of his mind, when it came to selling him, unless he was fond of going to court. Chrysippus puts this class also, the superstitious, among the fecund race of Menenius [a race furnishing a Roman example of familial psychoses.]

"O Jupiter, who givest and takest away great calamities," says the mother of a boy now lying sick for five months, "if thou makest the cold ague leave my child, on that day in the morning when thou appointest a fast, he shall stand naked in the Tiber."

Should chance or a physician recover the patient from this extremity, the silly mother by placing him on the cold bank will bring back the fever and kill him. Through what evil agent is she disordered in mind? By dread of the gods.

DAMASIPPUS REVIEWS HIS REMARKS.

Damasippus. These are the arms which Stertinius gave me, his friend, that after this I might not be attacked without being able to revenge myself. If anyone now call me mad he will hear that he is the same and learn to inspect the satchel that he carries behind him [referring to Æsop's fable of the two wallets].

Horace. Success to you, my Stoic, and may you sell everything to great advantage to make up for your losses—in what kind of folly (since there is not one kind alone), do you think I show my madness?—for I seem to myself to be of sound mind.

Damasippus. What! when the infuriated Agave carried in her hands the amputated head of her unhappy son, did she then think herself mad?

Horace. Well, I will admit myself a fool (let me yield to facts) and also crazy; only tell me this: with what kind of craziness do you think I am suffering.

Damasippus. Know then: first you exalt yourself; that is, you imitate the tall, though you measure but two feet from head to toe. At the same time you laugh at the majestic gait and airs of Turbo which are too much for his little body. How are you less ridiculous than he?

And whatever Macænas does, is it proper for you to do also?—you who are so unlike him and of so much less importance.

Some young frogs, when the mother was away, were stepped upon by a calf. One escaped and told her mother that a huge beast had crushed her brethren. “How big?” she asked. “Was it as large as this?” puffing herself up. Then making herself larger still, “As large as this?” While she was inflating herself more and more the young one said, “You cannot be equal if you burst yourself.” This example does not differ much from yourself.

Then add your verses—(which is adding oil to fire)—though if any sane man compose verses, you do. I do not speak of your outrageous passions.

Horace. Now, you can stop.

Damasippus. Your expense larger than your income.

Horace. Damasippus, mind your own affairs.

Damasippus. Your loves for a thousand girls, a thousand boys.

Horace. O greater madman, spare a lesser one!

MENDELISM AND NEUROPATHIC HEREDITY.

A REPLY TO SOME OF DR. DAVID HERON'S CRITICISMS OF RECENT
AMERICAN WORK.¹

BY A. J. ROSANOFF, M. D.,

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In reading Dr. Heron's pamphlet one is struck first of all by the unusual temper of the attack apparent on almost every page. The works of Davenport, Davenport and Weeks, Rosanoff and Orr, Goddard, and some others are analyzed in a fashion, or referred to, without a single feature being found in them to be worthy of anything but unreserved condemnation from the critic; and yet no other critic or reviewer has found so much to condemn in these works; on the contrary, these works have been, on the whole, very favorably received and commented on. It is natural that this circumstance in itself should arouse a suspicion of a special reason or motive underlying the attack; and perhaps in anticipation of such a suspicion our critic has felt it incumbent on himself to offer some explanations.

Thus we read: "The task of the critic is always an ungracious and unthankful one; but if Eugenics is to become a recognized branch of science with that additional sense of social responsibility among its workers that must arise when we are discussing men and not mice, then the unpleasant must be undertaken without regard to the personal feelings which strong criticism inevitably excites." (P. 4.) And further, ". . . those of us who have the highest hopes for the new science of Eugenics in the future are not a little alarmed by many of the recent contributions to the subject which threaten to place Eugenics with the older 'social science' and much of modern sociology—entirely outside the pale of true science." (P. 4.) It is evident that he would have us believe that only the interests of science, which might suffer but for his intervention, have led him to undertake the task of the critic; also that the self-imposed duty is performed with reluctance. Aside from the question of validity of the criticisms, which we shall take up later on, the very rhetoric of his style, the gusto

instilled wherever possible by harping repetitions, exclamation points, and other such devices, would indicate rather that his labor was carried on with much enthusiasm; any reluctance should surely have enabled him to confine himself more closely to the work of analysis.

Perhaps other passages in the pamphlet will throw more definite light on the question of reason or motive: "We propose to confine our criticisms to certain recent American work which has been welcomed in this country as of first-class importance, but the teaching of which we hold to be fallacious and, indeed, actually dangerous to social welfare." (P. 5.) "In this country we all know that a measure for the better control of the mentally defective has just been passed into law. No such law can touch at present those who carry this defect in a latent form, but such persons can be reached by the teaching that holds that parenthood must be looked upon as a sacred trust. The theory of Mendel has been used as an argument for the segregation of the mentally defective, and only recently we were told that to attack the application of Mendelian laws to the phenomena of feeble-mindedness was to wreck the passage of the Mental Deficiency Bill. If any argument for that bill be based on such slender considerations as the truth of Dr. Davenport's hypothesis, then the sooner the movement for the segregation of the feeble-minded is freed from such top-hamper, the less danger will there be of shipwreck." (P. 9.) "Why, we shall again be asked, does the Galton Laboratory waste its energies on destructive criticism? We shall be told, no doubt, that it is idle jealousy of the work of another laboratory. We are familiar indeed with this attitude of mind; the depreciation of well-meaning men, who do not see the gravity of the present situation—the impending danger that the new science of Eugenics will be strangled at its birth—as was the case of the once promising infant 'social science'." (P. 61.) "When we find such teaching—based on the flimsiest of theories and on the most superficial of inquiries—proclaimed in the name of Eugenics, and spoken of as 'entirely splendid work,' we feel that it is not possible to use criticism too harsh, nor words too strong in repudiation of advice which, if accepted, must mean the death of Eugenics as a science." (P. 62.)

The unfortunate position in relation to the scientific world of the English Biometrical school, to which Dr. Heron belongs, may account in some measure for the temper of the attack. They have, by reason of a pride in their own tradition, refused the guidance of the light of Mendelism, continuing to devote their time and labors to the investigation of the heredity of various traits in man as well as in animals and plants by purely statistical methods, while biologists the world over were piling up evidence of observation and experiment, continuously adding to the support of Mendel's theory. Eventually it came about that the work of the Galton Laboratory has been valued by the scientific world for the development of refined statistical methods and not as biological contribution to the subject of heredity. One may well say of the Galton Laboratory what Heine once said of his *alma mater*:

Zu Göttingen blüht die Wissenschaft,
Doch bringt sie keine Früchte.

The attitude of authorities toward the English Biometrical school has been well voiced by Bateson,² as follows: "Of the so-called investigations of heredity pursued by extensions of Galton's non-analytical method and promoted by Professor Pearson and the English Biometrical school it is now scarcely necessary to speak. That such work may ultimately contribute to the development of statistical theory cannot be denied, but as applied to the problems of heredity the effort has resulted only in the concealment of that order which it was ostensibly undertaken to reveal. A preliminary acquaintance with the natural history of heredity and variation was sufficient to throw doubt on the foundations of these elaborate researches. To those who hereafter may study this episode in the history of biological science it will appear inexplicable that work so unsound in construction should have been respectfully received by the scientific world. With the discovery of segregation it became obvious that methods dispensing with individual analysis of the material are useless. The only alternatives open to the inventors of those methods were either to abandon their delusion or to deny the truth of Mendelian facts. In choosing the latter course they have certainly succeeded in delaying recognition of the value of Mendelism, but with the lapse of time the number of persons who have themselves witnessed the

phenomena has increased so much that these denials have lost their dangerous character and may be regarded as merely formal."

We have dwelt on the temper of Dr. Heron's attack and on its probable reason or motive because it may have a bearing on the validity of the criticisms: any judgment rendered under the influence of a special bias and in a state of irritation can hardly be expected to be wholly impartial. Presently we shall try to answer, as far as possible, the specific criticisms of our work; this we have undertaken to do not in the hope or even in the desire to convince Dr. Heron or others attached to the biometrical school, but rather to defend our work before a tribunal of readers more likely to be without bias.

The first point criticized is the use of the term "insanity" in the title,³ which use, the critic says, is very misleading, as the paper deals largely with the inheritance of the more comprehensive group of conditions under the general designation of "neuropathic constitution." An important matter is here touched on by the critic, but not one that we had overlooked. The material with which we started consisted entirely of institutional cases of certified insanity, but as we proceeded to study the genealogies in these cases we found not only other cases of certified insanity but also cases of epilepsy, hysteria, feeble-mindedness, alcoholism, and other anomalies; and in this respect the experience of every psychiatrist has been exactly like ours; the question is, then, whether only those certified as insane should be put down as affected individuals or also others presenting neuropathic anomalies but not certified as insane, and, if the latter, then what kinds and what degrees of anomaly should be regarded as justifying the counting of the individuals in question as affected. The present status of psychiatry is such that a full and exact answer to this question is hardly to be expected; and when in the study of data one is placed in a position necessitating the adoption of a definite policy the best that he can do is to guide himself partly by the prevailing judgment of other psychiatrists and partly by his own judgment and experience.

As a matter of fact certification of insanity is but an accident which may or may not come to pass in the life of a neuropathic

person; it depends on such matters as the presence or absence of anti-social manifestations, the nature of environmental conditions as tending to maintain or to disturb the mental equilibrium of the subject, the social standards of the community, etc. The policy pursued in our work is discussed in our paper as follows: "It is interesting to note that what we learn in institutional experience to recognize as insanity is a comparatively uncommon group of manifestations of the neuropathic constitution, for of our total of 437 neuropathic subjects (not counting the 21 who died in convulsions in early childhood) only 115, or 26.3 per cent, presented at any time in their lives indications for commitment to sanitariums or hospitals for the insane; moreover, it is obvious, where the facts are known in detail, that in most cases in which such indications have occurred they were in the shape of special reactions to special environmental conditions; and it seems equally obvious that our definition of the various types of neuropathic constitution must be in terms not of such special reactions, but rather of the more stable and more general underlying psychical traits and tendencies."

What is the attitude of leading psychiatrists in regard to this question?

Kraepelin⁴ has expressed himself as follows: "The psychopathic charge of a family may reveal itself not only by the appearance of mental disorders but also by other forms of manifestation. Here belong before all those diverse slighter deviations from mental health which go to make up the borderland of insanity: nervousness, states of anxiety and compulsion, constitutional depressions, slight hysterical disorders and forms of feeble-mindedness, tics; also odd characters, peculiarities in mode of living, criminal tendencies, lack of self-control, intemperance, love of adventure, mendacity, suicide on an inner basis."

The opinion of Peterson⁵ is very similar: "In determining the factor of heredity we must not be content with ascertaining the existence of psychoses in the ascendants, but must seek, by careful interrogation of various members of the family, for some of the hereditary equivalents, such as epilepsy, chorea, hysteria, neurasthenia, somnambulism, migraine, organic diseases of the central nervous system, criminal tendencies, eccentricities of character, drunkenness, etc., for these equivalents are interchangeable from

one generation to another, and are simply evidences of instability of the nervous system. It is the unstable nervous organization that is inherited, not a particular neurosis or psychosis, and it must be our aim in the investigation of the progenitors to discover the evidence of this."

Finally we would cite the opinion of Dr. Urquhart* as given in one of the memoirs of the Galton Laboratory itself: "But it would be a narrow view of insanity which would cause the observer to restrict his records to cases of declared failure of the integrity of mind. It is now recognized that the graver neuroses (hysteria, somnambulism and the like), that eccentricity, that a want of mental balance frequently appear among the progenitors of the insane. There is a transformation of neuroses in one generation into obvious insanity in the next. Similarly alcoholism in one generation may issue in insanity in the next, and on the other hand the most inveterate drunkards are often the immediate descendants of insane persons."

In the literature on the subject of heredity in insanity we find, in fact, but one work in which the need of taking account of neuropathic conditions other than certified insanity is ignored; the work is that of our critic, Dr. Heron,⁷ from which we quote: "The material on which the present memoir is based was most kindly provided by Dr. A. R. Urquhart, physician superintendent of the James Murray's Royal Asylum, Perth." "The Perth records consist of 331 family trees. Each gives the total number of brothers and sisters of the patient, stating the order of birth and in many cases the age of each, and classifying each as insane, neurotic, alcoholic, epileptic, eccentric or normal." "If the insane diathesis be inherited, it is much more important to know the number of relatives who have at any time been certified as insane. In the present memoir we understand by the insane members of a family those who at any time in their lives have been treated as insane." Accordingly we find in Dr. Heron's statistical analysis of his material all subjects classified as either "Insane" or "Sane" or "Not Insane," taking no account whatever of Dr. Urquhart's characterization of many cases as "neurotic, alcoholic, epileptic, or eccentric."

We do not assert and never have asserted that we possess a full and exact answer to the question of the proper delimitation of

the conception of the neuropathic constitution; we have asserted, on the contrary, that such an answer psychiatry, in its present status, does not afford; we feel, accordingly, that in classifying subjects as affected or not affected we have in all probability made some errors in both directions; but we also feel that in pursuing our policy as outlined above we have reached a far closer approximation to the truth than did Dr. Heron in his study. He has gone so far as to accuse us of having done a "disservice to knowledge"; it seems to us that we would be better justified in making such an accusation against him, had but his work received the amount of attention in the scientific world as to merit the imputation of strength implied in such an accusation.

The next point picked out by our critic is what seems to him an inconsistency on our part. We say in our paper: "In selecting cases our aim has been to exclude all those forms of insanity in the causation of which exogenous factors, such as traumata, alcoholism, and syphilis, are known to play an essential part. . . . We are not inclined to dispute the possible influence of heredity in these conditions; we have excluded them merely for the purpose of simplifying our problem by avoiding the necessity of dealing with a complicating factor in the shape of an essential exogenous cause." This in itself is not objected to by our critic; what he does object to is that having excluded alcoholic psychoses from amongst the cases selected for study, we nevertheless counted as affected cases of alcoholism occurring in ancestors or collateral relatives even if unaccompanied by obvious psychosis. What would he have us do? We could select our *cases* in any way that seemed wisest to us, but we could not choose the *ancestors or collateral relatives*; of course we could have counted alcoholics as not affected whenever we came across them, but by doing so we should have surely given him better grounds for offering a criticism than he had as it was; for, it is curious to note in view of his criticism, he himself has been led in a recent study to declare that alcoholism is very largely an expression of inborn mental defect; we will quote his own words⁸: "We are on fairly safe ground in asserting that the relationship between inebriety and mental defect is about .76. We have thus reached a definite measure of a relationship on which every authority on alcoholism has laid the greatest possible stress." "On the one hand, mental condition is usually re-

garded as being directly affected by alcoholic excess and on the other hand the extent of the individual's education is very largely determined by causes which are pre-alcoholic; yet we find here that there is a close relationship between the two characters, and this is strongly in favor of the view that the defective mental condition of these inebriates, like the extent of their education, is pre-alcoholic and that the alcoholism flows from a pre-existing mental defect, not the mental defect from the alcoholism." "All this lends support to the view that the mental defect of the inebriate is not an actual growth; it is born, not bred; that 'inebriety is more an incident in the life of the inebriate than the cause of his mental defect'."

We now come to a point when Dr. Heron takes up our conclusions *seriatim*, and we meet at once with a misapprehension on his part wherein he takes our statement of theoretical expectation according to Mendel's law for conclusions; we believe, indeed, that the neuropathic constitution is transmitted by heredity in Mendelian fashion but we are fully aware that our material does not show an exact correspondence between theoretical expectation and actual findings; what is more, the variable and for the most part unknown rôle played by environmental factors in the production of insanity is such that exact allowance for it can hardly ever be made, so that it may be anticipated that no collection of material will so reveal the facts as to afford a hope of finding such correspondence except by way of somewhat accidental coincidence; this, however, need not discourage us from trying to account, where it seems possible to do so, for small groups of cases which show failure of correspondence with theoretical expectation. If demonstration of the truth of Mendel's law were dependent on any material such as ours, the reviewer might well take exception to our method of analysis; or if the correspondence between theoretical expectation and actual findings, as it almost obtrudes itself upon the observer, were not at least approximately close, one might likewise take the stand of the critic and say that since so much explanation is needed, the case is unduly forced; but the fact is, it need hardly be stated, that Mendel's law is fully established on the basis of innumerable data of biological observation and experiment quite independently of our necessarily imperfect material, and that the approximate correspondence between our findings and theoretical expectation

would better justify us, in all common sense, to seek some explanation for observed exceptions rather than, on the basis of these exceptions, to reject the validity of Mendel's law in application to our case, and to assume at once that a series of traits well known to be hereditary in their essential nature is transmitted from generation to generation either in wholly irregular fashion or in accordance with some other, as yet undiscovered, law.

Thus in the case of the offspring from matings of type *a* ($RR \times RR = RR$), 64 in number, instead of all being neuropathic according to theoretical expectation, only 54 were neuropathic and 10 were normal; in examining the data pertaining to these normal cases we found that 8 of them were very young, namely, from 8 to 22 years of age, and as to these we suggested the explanation that they had not reached the age of incidence.* This explanation is objected to by our critic as follows: "We have already seen that the neuropathic constitution ranges from infantile convulsions to senile deterioration; what, then, is the age of incidence?" The answer is, our critic knows very well what the age of incidence is, for he has figured it out himself in the study already referred to from material furnished by Dr. Urquhart, giving it as " $37.9 \pm .6$ and a standard deviation of $13.6 \pm .4$." These figures of Dr. Heron's mean that if by any method it were possible to select a group of persons who were *a priori* either insane or fated to become so, the probability is that the majority of those under 24 years of age in that group would not be found to be, in fact, insane; of course it is true that subjects fated eventually to become insane may have various more or less pronounced neuropathic manifestations in childhood or at any time prior to the actual mental breakdown, but it is equally true that in the majority of such subjects the morbid tendency remains entirely latent, or at least so slight as to pass unnoticed, through the early years of life.

Similarly our critic points out that some of the subjects, the offspring of other types of matings, which have been counted by us as normal may have been young, that is, below the age of inci-

* We have made no systematic attempt to keep track of any of the subjects constituting our material; it will, however, interest the reader to learn that of the eight subjects here referred to one has, since the publication of our data, developed unmistakable evidences of mental derangement, according to information which reached us quite accidentally.

dence, and that there is a possibility that some of these were in reality fated eventually to become insane. This, of course, is not in anyone's power to deny; dealing, as we had to in our work, with subjects of all ages, the full life history was available in but a small number of cases, namely, those in which death had occurred in advanced senility; we would point out, however, that whatever error is involved here must be insignificant inasmuch as the total number of young subjects is comparatively small—only a few in the fraternities of the youngest generation, which is almost entirely the generation of our patients and their siblings, and hardly any among the sibships of the second generation, which is almost entirely that of the parents of our patients. We know of no way in which an allowance for this small error could have been made which would have provided satisfactory correction; if we had arbitrarily assumed that a certain fraction of these young subjects were fated to become insane and were therefore to be counted as affected and not normal it would have resulted, for the offspring of matings of types b and b_1 ($DR \times RR = DR + RR$), in closer approximation to theoretical expectation, and for those of types d and d_1 ($DR \times DR = DD + 2DR + RR$), in less close approximation, the net result remaining about the same as that arrived at by us without the aid of such an arbitrary assumption; Dr. Heron's suggestion to the effect that we should have excluded all subjects under the age of 38 would have resulted obviously in such over-correction of the error as but to introduce another error, of greater magnitude.

The next point of our critic's attack is on the question as to which among normal subjects should be counted as *duplex* and which as *simplex*. In a given case this question has to be decided on the basis of the presence or absence of neuropathic subjects among the ascendants, siblings, or offspring of the individual in question; for a trait which, like the neuropathic constitution, is obviously recessive, if at all transmitted in Mendelian fashion, there is no stronger evidence of a *simplex* condition than the presence among the offspring of the individual in question of affected subjects; the assumption in such cases is, of course, that the neuropathic taint carried by such a normal individual and transmitted by him to some of his offspring is handed down to him from his own ancestors, and in some cases we found, in addition to affected offspring,

other evidence in the shape of affected siblings or parents. Dr. Heron says we had committed a blunder in assuming that every normal individual with a neuropathic sibling is necessarily *simplex*; it is hard to see where he found the evidence of our having made such an assumption, for not in a single case have we counted a subject as *simplex* on the sole basis of the existence of neuropathic siblings, demanding in every case the stronger evidence of the existence of a neuropathic parent, or offspring, or both.

As to the question of classifying a normal subject as *duplex*, it must be pointed out before all that complete proof of the correctness of such classification cannot possibly be had in any case; the *duplex* condition can be *excluded*, on theoretical grounds, in the case of a normal individual who has either a neuropathic parent or a neuropathic offspring, but no other data concerning relatives can either establish or exclude it.

There is, however, no doubt of the fact that the majority of normal individuals in an average community are, theoretically *duplex* and not *simplex*, or, practically, not capable of transmitting to their offspring the neuropathic constitution; the mere fact, then, of an individual being normal turns the probability in favor of the *duplex* condition; if such an individual, known to have a neuropathic mate, has more than three children, all of whom are normal, the probability of the *duplex* condition in his case is thereby vastly increased (we say more than three children because, in particular, the offspring of our matings of the type *c* ($DD \times RR = DR$) averaged in number $3.2 \pm$ per family, not including those who died in childhood or concerning whom the data were unascertained); if in addition it is stated by informants that none of the relatives of the individual in question were known to have nervous or mental disorders of any kind, it seems reasonable to take the stand that the error which might be incurred in classifying the subject in question as *duplex* could be, for the mass of material thus treated, but very slight; and that if the only other alternative were accepted—that of classifying the subject as *simplex*—greater and at the same time purely gratuitous error would surely be incurred.

In this connection the critic takes us to task for not presenting in our charts the data concerning the ancestors and collateral relatives of the subjects classified as *duplex*. It so happens that all

but one of the matings, in which one of the mates is classified as *duplex*, have occurred either in the generation of grandparents or of great-grandparents of our patients; though we have in every such case the general testimony of our informants to the effect that none of the immediate relatives of the individual in question had, as far as they knew or had heard, any nervous or mental disorders, we made as a rule no attempt to collect data concerning each relative in particular; we felt that such data would have to be given from memory or hearsay and would be hardly of any greater value than the general negative statement, and for the few cases for which such data had been obtained we still felt that the general negative statement was of as much value as the data themselves, and were thus guided in the preparation of our material for publication. That the matter had received our attention may be judged from the following passage which we quote from our paper:

"In the actual analysis of the data collected in the course of our investigation the problem in each case was to distinguish, on the basis of the information obtained by questioning the relatives, neuropathic states from the normal state, and in the case of a neuropathic state to identify, if possible, the special variety. Such diagnosis often presents great difficulty when there is opportunity for direct observation, but when it has to be based upon observations of untrained informants related from memory the difficulty is, of course, greatly increased, and with it the chance of error. We have endeavored to reduce the amount of error from this source by interviewing personally as many as possible of the nearest relatives of the patients whose pedigrees were being investigated, and by the practice of tracing almost all the families not farther than to the generation of grandparents, for the farther back our inquiries extended the more scant and more vague was the information which we were able to obtain."

In view of the practical impossibility of absolutely establishing the fact of the *duplex* condition in any case, the fact of a chance of error in thus classifying a number of subjects must be admitted, no matter how abundant the evidence may be; it may be noted in passing that this source of error is not a discovery of Dr. Heron's at all; we had been fully aware of it and had taken it into account; we must here quote again from our paper: "On the

other hand, the fact of *duplex* inheritance was in every case based upon the absence of neuropathic manifestations in ancestors and collateral relatives, as far as known, as well as in the offspring;—but inasmuch as in scarcely any case was the family history traced farther back than the third generation it is clear that the possibility of *simplex* inheritance was in no case positively excluded; we have here, therefore, another source of error which, fortunately, is slight, and affects the least important part of our material, namely, the cases of matings from which no neuropathic offspring have resulted."

Before passing on to the next and last criticism we would point out what can only be considered either a wilful misstatement or another misapprehension on our critic's part. He asserts repeatedly that the subjects whom we have tentatively classified as *duplex* are said by us to be "normal and of pure normal ancestry"; this is simply not true; the truth is that not a single subject investigated by us has been described either in the paper criticized by Dr. Heron or in any other paper published by us as being "normal and of pure normal ancestry"; on the contrary, our attitude is and has always been that it would be impossible in practice to say that truthfully of any subject; the expression has but a theoretical value and is used by us only in the statement of the theoretical expectation in accordance with Mendel's law. We have already had occasion above to refer to his mistaking our statement of theoretical expectation for conclusions; this is evidently a part of his general method; he might as well have asked how it was that we had "drawn the conclusion" that "Both parents being normal and of pure normal ancestry, all the children will be normal and not capable of transmitting the neuropathic make-up to their progeny," without having in our material a single instance of such a mating showing such results: it isn't a conclusion at all and is not offered as such; it is a part of the statement of theoretical expectation according to Mendel's law, which is made by us in the belief that we have gathered convincing evidence to show that that law holds for the case of neuropathic heredity.

In approaching the end of the section devoted to the criticism of our paper Dr. Heron, apparently carried on by sheer inertia, is glibly "rejecting" without even stopping to say just what it is he

is "rejecting" and why; finally, however, he does offer one more specific criticism; in his parting shot there is so much that is illustrative of his temper and method that we feel impelled to quote his words in full, simply trusting that the gentle and patient reader will forgive us for so doing: "It is unnecessary to follow the authors in their discussion of degrees of recessiveness or of equivalent defect, but it may be noted that the last result, that about 30 per cent of the general population, without being actually neuropathic, carry the neuropathic taint from their ancestors and are capable under certain conditions of transmitting the neuropathic make-up to their progeny, must also be rejected. Apart from any other blunders, the authors have forgotten that when a simplex individual mates with a neuropathic or another simplex, it by no means follows that at least one of the children will be neuropathic; in the latter case three-fourths of the families of one, nine-sixteenths of the families of two, etc., will have *only* normal offspring. Even an elementary knowledge of Mendelian theory would have been sufficient to enable the authors to avoid such an obvious pitfall."

As regards the last remark we submit that the point at issue has nothing to do with Mendelian theory and that therefore one's knowledge of Mendelian theory is not shown in the way he deals with that point; it has to do rather with theory of probability. He declares we "have forgotten" that among the offsprings of the matings in question there will not necessarily be in every family at least one affected; now, whatever might be said of Dr. Heron as a critic, we are here impelled to point out that as a mind-reader he is an utter failure; he must surely grant that on matters of purely subjective fact, such as what we have tacitly assumed or what we have forgotten, we possess better information than he; we have already told him that what he said we had assumed we had, in fact, not assumed; we can now tell him that what he says we have forgotten, we have, in fact, not forgotten. The reason for our taking into account, in the above connection, *only* the families in which there was at least one affected subject is that *only* such families contain, in the shape of the affected subject, justification for counting both mates as having the neuropathic taint; as regards other families in which none of the offspring were affected we admit the possibility that both mates may have

been *simplex*, but there is no *proof* of it in any case. If it should be argued that, in view of this possibility, our figure is probably an underestimate, we would say that that, too, is quite likely; the trouble is, however, that no data are available that would enable one to determine to what extent our figure is an underestimate and, therefore, how much must be added for correction. However, our critic might have realized that our figure is offered not as an exact estimate of the prevalence of the neuropathic taint; who in the world could make an exact estimate? What we meant was to draw attention to the evidence contained in our material which startled us and which, in general, is hardly suspected, showing that a very large proportion of the general population is capable under certain conditions of producing neuropathic offspring; for the present, at least, importance attaches not to the question whether the exact proportion is 25, or 30, or 35 per cent, but rather to the fact that it is not some fraction of one per cent, or two, or three per cent. Had our critic, indeed, not gone out on the war path determined to find fault, he might have noted that we said "Our data seem to show that no less than 31.6 per cent of the general population carry the neuropathic taint." Anyone might know that "our data seem to show" does not mean "all data would, or ever shall, show," and that "no less than 31.6 per cent" does not mean "no more than 31.6 per cent." If later, in the conclusions, we say, in reference to the same data, that "It is estimated that about 30 per cent (deducting 1.6 per cent for those actually neuropathic) of the general population, without being actually neuropathic, carry the neuropathic taint," etc., it would seem clear that we do not mean "It is fully established that exactly 30 per cent," etc.

We fear we have already fatigued the reader with this sorry business of refuting a manifestly unfair and incompetent criticism; our plea is, however, that our critic having made the attack, it remained for us either to say nothing, and thus possibly allow some to think that we had no answer to make, or to answer; we have thought enough of our work to consider that it merited a defence; others, whom we consulted, have thought the same, and we have accordingly chosen the latter course. Such being the situ-

ation we feel that our answer, to be full, must take into account not only the actual criticisms, but also every other phase of the attack. Therefore, we still have to refer to a passage in the pamphlet which reveals a feature of method not quite so apparent elsewhere, namely, *insincerity*. The passage is directed not only at our own work, but at the whole group of American researches; the critic declares, "The authors have in our opinion done a disservice to knowledge, struck a blow at careful Mendelian research," etc. Who is it that pretends to resent "a blow at careful Mendelian research"? It is a representative of a school which has always disputed the validity of Mendelism and the scientific standing of which in the field of heredity has heard its death-knell sounded as a result of "careful Mendelian research." The data of human heredity, particularly in the domain of psychic traits, can never compare with the best data of experimental biology; if one is led to deal with them it is owing to their importance and not to any notion that they are possessed of the highest scientific value; fortunately, in dealing with them, guidance having been made available by biological science, the problem before the investigator is not to discover or establish laws but to apply them, and material which may be unfit for the former purpose may serve very well for the latter.

To summarize, our critic, in spite of his evident determination to disprove the value of our work, has not succeeded in finding sources of error of which we were not ourselves cognizant and which we had not ourselves frankly discussed in our paper; neither he, nor we, nor others have as yet succeeded in suggesting any way of eliminating such sources of error. The main question that has relevancy as to the trustworthiness of our material is whether subjects counted by us as affected or not affected have been thus counted correctly; the question is purely one belonging to the domain of clinical psychiatry; our policy in regard to this question has been that which bears the approval of present-day psychiatric science and which is based on the universal experience of clinicians; that some mistakes have not been avoided after all, that some cases counted as affected have been wrongly so counted, and that others counted as not affected have also been wrongly

so counted, is undoubtedly true, and we have said so in our paper: "On the whole no pretension is made here of total elimination of error; but we believe that whatever errors remain they are not sufficient to invalidate the material as a basis for our study." This belief rests on the conviction that the errors are slight and, being in both directions, balance themselves to some extent. The burden of proof is upon the critic who, though a layman, assumes an attitude, in relation to a psychiatric issue, which is in opposition to a view universally held by psychiatrists; and if he, furthermore, attempts to disqualify, on the basis of his attitude, work which in his opinion contains too large a margin of error, he must in addition take the burden of furnishing an acceptable measure of the error before his criticisms can be rendered valid; this our critic has not done.

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THE PHYSICAL AND MENTAL STATES IN CHRONIC CHOREA.

SUMMARY OF NINETEEN CASES OF CHRONIC PROGRESSIVE CHOREA WITH THE POSTMORTEM FINDINGS IN EIGHT CASES.

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The cases of chronic progressive chorea, or as it is variously called chronic hereditary chorea, degenerative chorea, Huntington's chorea or dementia choreica, upon which this paper is based, have been treated in the Government Hospital for the Insane.

Ancestry.—In the ancestry different nationalities are represented: Germany thirteen times, United States six, England four, Scotland three, Ireland four, France and Holland each once; the nationality of six ancestors is unknown.

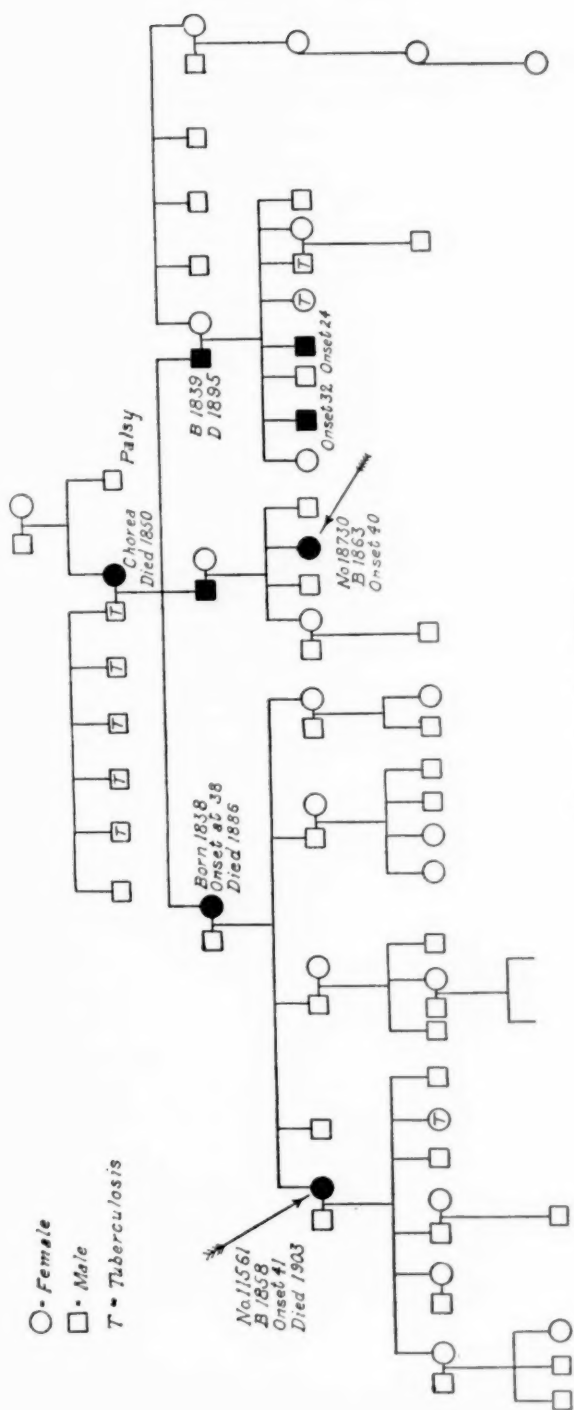
Nativity.—The nativity of one was English, one Scotch and seventeen were born in the United States—seven in Ohio, three in New York, three in the District of Columbia, two in Pennsylvania and one each in Indiana and Virginia.

Race.—All are white—no case of chronic chorea having been noted so far among the colored insane here.

Heredity.—Definite neurotic heredity is present in eight cases; such history is insufficient or denied in the others. The percentage in the ancestry where careful search for hereditary chorea is made ranks high, and the history is probably insufficient in many cases regarding antecedents with chorea when such history is obtained from the patient on account of the frequent failure of recognition of the disease by the patient, and the history from relatives may be misleading on account of the family stigma. Probably the more accurate family history has been obtained in what is called the hereditary or Huntington type, and again the biological law, "every organism reproduces the leading characteristics of its ancestors at a corresponding or earlier stage in its existence," may apply to a number—the parent may have escaped chorea on account of an early death. Cases 11241 and 19882 are brother and

sister; Cases 11561 and 18730 are cousins, as shown on the accompanying chart, for which I am indebted to Miss J. H. Ross, the field worker in eugenics at this hospital. The family tree shows eight choreics, the male choreics being represented by the shaded squares and the female choreics are represented by shaded circles. The chart indicates the usual observation that if a generation is skipped the disease does not immediately reappear in the offspring. Further research into the history of the progeny of the non-choreic offspring is needed.

Incidental.—Among other possible factors than heredity in the etiology, I will mention the history of preceding diseases or other incidents which the patients' friends and relatives use to excuse the presence of the disease. Case 10982, the supposed cause is alcoholism. Case 11241 suffered trauma to the head, and this was considered and asserted as having to do with his psychosis. About 24 years later his sister was admitted to the hospital with well marked chorea (No. 19882), and her history states that she has been always feeble-minded; their mother died insane. Case 11561 has domestic trouble as the supposed cause—she is one of the eight choreics in the chart. In Case 12004 both the father and patient were addicted to the use of alcohol; the patient indulged in sexual excesses and had typhoid fever eight years prior to the onset of chorea. Case 12211, lost her mother at the age of 33 and though previously "nervous," her condition was said to become aggravated. It is notable that her sister is neurasthenic. Case 13923 had influenza; her mother was insane and her father was confined in an institution. Case 15313 is said to have had heat exhaustion and alcohol was supposed to be an exciting factor. Case 16907 states he fell from a tree and sustained an injury which incapacitated him for one year; he gives a history of dysentery, "typhoid pneumonia," erysipelas and rheumatism. Case 18077, never used alcohol; although married ten years has no children; at one time suffered with dysentery. Case 18607, denies nervous disease in his family, although from other sources it is learned that his father is an invalid and impaired mentally. Patient suffered with chicken-pox at 15, had diphtheria several times and also malaria. Case 18730, shown on family chart, is said to have suffered from acute otitis media. Case 19250 gives a history of sun stroke when



HUNTINGTON'S CHOREA.

aged 31, later malarial fever and pneumonia. He was treated at the age of 42 for bronchitis and tonsillitis. Case 19564 was treated for constipation, hemorrhoids and chronic neuritis. There is a history of excessive drinking one year previous to the onset of chorea. Case 19801 (father choreic) had measles, mumps, parotitis and specific urethritis.

As regards sex, five are female, and 14 are males, but it must be remembered that there are approximately three times as many male patients as female in this hospital. Nine were married, one widowed and nine unmarried.

Occupation.—The occupations varied; one female had no occupation, one was a housewife, one a seamstress and a fourth a dress-maker; the fifth was a domestic. Nine males were ex-soldiers and had other occupations, as farmers, printer, laborer; another male was a laborer, and convict on account of assault; one was a mail clerk, one a member of the Marine Corps, one painter, one musician. Regarding the high percentage of soldiers, it must be remembered that it corresponds with the large percentage of this hospital's population, derived from the army and navy.

The ratio of choreics to the cases admitted to the hospital on account of insanity is 1 to 696.

Physical Examination.—Physically, stigmata of degeneration were not prominent, with the exception occasionally of dorsal kyphosis and a rather wild appearance, or one suggestive of bird of prey. The condition of nutrition at the onset was usually good. The skin was anemic or sallow; in no case was the complexion good. Perspiration was abundant, as was also the quantity of hair. Vasomotor changes were not prominent, nor were there evidences of constitutional diseases. As a rule there were no complaints of illness or pain. Occasionally cramp was mentioned, due to the sudden forcible jerking of a muscle infrequently used. Dizziness and fainting sometimes occurred. Fatigue was not complained of. Convulsions were rare, but occurred in five of the cases; they were general and consciousness was lost (Cases 6623, 11241, 13923, 18097, 18607). Tremor or fibrillation was not observed. Cranial nerve conditions in order were as follows: Smell was somewhat impaired in one case, who was unable to realize that asafoetida was unpleasant; he also failed to recognize peppermint.

camphor, clove oil or tobacco, although he was able to recognize turpentine and whiskey (19350). Case 12004 smell was impaired; Case 18607 thought turpentine was water, did not recognize whiskey, asafoetida, camphor, clove oil, etc.; Case 18730 failed to recognize the most unpleasant odors as such, nor did he name any correctly; Case 19882 failed to recognize odors. The patients were not subjectively aware of the impairment in the olfactory sense.

The tongue as a rule did not show atrophy, but took part in the jerky movements. Taste, although inaccurate in a number examined, was better appreciated than smell. It was good in 12004; Case 18077 normal. Case 18607 was unable to recognize the taste of salt; quinine solution had no taste to him on four tests. He failed to recognize the taste of tartaric acid, but recognized sugar as sweet. Case 18730 recognized syrup as sweet, acid sour, quinine bitter and salt, salty. Case 19350 recognized salt as such; sugar he thought was like orange; bitter, sour; tartaric acid, sour; quinine, bitter. Case 19882 recognized all tests.

Ocular movements of choreic nature occur. The eye is rolled upward and outward, producing a sinister appearance, or staring into space in a vacant manner occurs (12004). The eyes are directed to one side or the other; he fails to look upwards when requested, but looks to either side or downward on request. Case 15313, the eyeballs roll involuntarily. Case 18077, staring frequently occurs; there is difficulty in looking upward, but he can move the eyes laterally and downward. Case 18607, stares ahead; the eyes are prominent; movements of the eyeballs are limited; he cannot follow an article by moving the eyes upward, after it passes the horizontal visual plane; has difficulty in looking to the left with either eye, or with both. Case 19350, muscular action of eyeballs choreic. Case 19564, ocular muscles involved. Case 19801, eye muscles involved. Case 16907 choreic movements of eyeballs occur. In many of those cases, especially those who hold their heads downward, the choreic motions of the eyeballs are not observed unless the head is held face upward by an assistant while choreic motions of the eyeballs are looked for by examiner.

Vision is good in most of the cases, although one case had cataract of both eyes; another had an old choroiditis with vision O. D. for large objects; and O. S. 20/100. As a rule the pupils

are equal, round in outline and react to light, consensual and accommodation. Conjunctivitis was frequently present. Visual hallucinations were not present.

Interference with mastication was only slight.

The facial expression shows great variety in its contortions and is always changeable. There occur frowning, elevation of the eyebrows, the eyelids close and open widely, winking, also staring, smiling, sneering, grimacing and wrinkling of the face, retraction of the angles of the mouth, smacking, pouting, pursing and other motions of the lips. The head nods, bows and ducks. Rotation of the head occurs. Blowing, and puffing of the cheeks is frequent. The tongue clicks, may be protruded and immediately withdrawn. About one-half the number had an indifferent expression; three presented a sleepy appearance with drooping eyelids and the others seemed alert or at times depressed. The facial expression of indifference did not correspond with the duration of the disease, but appeared to be associated with its corresponding emotional state.

Hearing was slightly impaired in about one-half the cases. Ordinary conversation was readily heard, but a watch was heard at only about half the usual distance. Whispers were not readily heard. Ordinary conversation was heard in one case (13923); she was noted as somewhat deaf. The impairment of hearing is, in the majority of cases, very slight.

Dizziness was complained of in only one case and was generally denied in the others. Although equilibrium was not well maintained and falls occurred, the loss of equilibrium is ascribable to motor instability rather than impairment of the vestibular nerve function. Only rarely is it possible for the patient to hold the feet together sufficiently long to test the station.

Dribbling of saliva occurred very rarely.

Cutaneous sensibility: Case 12004 complained of numbness around the right knee, but there was no anesthesia on examination. Case 12211 was hypersensitive. Case 13923 had no anesthesia or paresthesia. Case 16907 localizes touch correctly, but is hypersensitive to cold; keeps his window closed even in summer and always must have a heavy blanket on his bed. He is suicidal, but has not reacted differently to the usual person when his injuries are sutured. Sensibility to pain was present. Case 18077, the

tactile sense shows no deviation from the normal; pain sense is acute; marked variations in temperature are readily recognized. It is very difficult to recognize finer changes. Muscle sense normal. Stereognosis normal. Localization of touch is fairly accurate. There is no anesthesia or analgesia to pin points. Case 18730 recognizes light touches and pin pricks, but reacts only slightly to the latter in the upper extremities. Localization is inaccurate, and when touched with cotton occasionally says it is a pin. She claimed heat stimuli were cold and vice versa, and failed to make the usual defense reaction when hot water tests were applied, still maintaining it was cold. Sensation was delayed. Case 19350 has no anesthesia of the skin. Case 19564, localization was good; there was no analgesia or anesthesia. Case 19801, failed to cooperate, but no tender areas were made out and plantar defense reaction was present. Anesthesia was not present in those who attempted suicide (12211, 16907). Case 19882, touch, pain, heat, cold, and stereognosis normal.

It is in the motor functions that the most evident symptoms of the disorder are manifested. In efforts at using the hands or legs they are at first clumsy. Later there occur during waking hours, at approximately the rate of 80 per minue, irregular, incoordinate, purposeless, unwilling, jerky movements, such as affect the functions of the larynx and pharynx. Clicking noises are made by the vocal apparatus; a forced cough occurs; deglutition and speech are impaired; a number seldom speak or the speech is hesitating, stumbling, mumbling, slow, interrupted frequently by clicking sounds, or may be jerky, thick, blurting; the tone may be low and whining or high-pitched, abusive, vile, insulting, profane, threatening often, or obscene, often with a sexual trend, making accusations regarding the nurses' conduct with various patients. One patient says, "I want my discharge out of this God damn hell, hell, HELL," with increasing emphasis to the last word; or again, he is noisy by screaming, begs the nurse and fellow-patients to cut his throat and threatens suicide by starving; says "I want to kill my damn fool self and get out of this damn world." A number speak indistinctly or make no effort to reply. The faculty of speech, which in the end is a motor manifestation, may be markedly interfered with, monosyllabic, and almost impossible to understand. The ability to nod the head for yes or shake the head in the

negative is interfered with and unreliable, owing to the head nodding and lateral motion, and it becomes impossible for the patient to communicate with those about—a truly aphasic condition. In a number this extreme degree may not be reached, but the speech is halting, explosive, words are slurred or run together and enunciation indistinct. Pauses occur out of place and it takes a longer time than usual for the patient to express a sentence. Comprehension, however, may be tested for and regarded as present when speech is lost, if on request the patient moves from one place to another, etc. Writing shows irregularity and increased pressure out of place. One patient stated, "I was a good writer! now I make hen tracks."

Spasmodic inspiratory and expiratory jerking of the respiratory muscles occur. The muscles of the neck jerk, causing the head to bend forward, backward or to the side. The shoulders are shrugged or elevated. The muscles of the trunk are also markedly affected and in consequence there are distortions of the body, the patient bends, twists, turns, bows and salaams. The body sways to one side or the other, twists and bends forward and to such an extent that the patient will sometimes think he is about to fall from the chair in which he is seated. The arms, forearms and hands are flexed and extended at the different articulations. In conveying food to the mouth it is sometimes elevated high above the head and spilled on the clothing or floor. The grip varies in pressure, so that articles held in the hand are flung or dropped. The fingers are intertwined or interlocked in efforts to lessen the motions. Jerking of the fingers occurs and gestures, gesticulations and saluting with the hand are often seen. The upper extremities are seen to paw, reach, or make motions as if striking.

The lower extremities are twisted, the thighs abducted and adducted, the legs flexed and extended alternately or elevated from the floor. The knees are frequently crossed. Kicking and backward movements are made by the legs, although the patients put themselves in the most favorable position to lessen the motions. The gait is spastic, incoordinate, clumsy, reeling, lurching, staggering, stalking, stumbling, springing, wriggling, dancing, shuffling, running, and halting. A sidestep or backward step is taken, so that progression is greatly impeded. Occasionally a patient will be seen to hop or fall. Frequently a limb is extended laterally,

and on going to meals the patient will endeavor to run. Sometimes the limbs are dragged sideways and knocked against tables, chairs, etc. With these accidents and the usual falls to the patient's knees or to the floor, many bruises, cuts or fractures result. The body weight is shifted irregularly from one lower extremity to the other. It is almost impossible for the patient to walk a straight line or place the feet for the Romberg swaying test. Although able to walk for exercise in the early years of the disease, it finally becomes impossible to walk without assistance. The usual tests for coordination show marked awkwardness. In short, all varieties of incoordinate movements of the voluntary muscles occur to a mild or exaggerated extent, less during repose but more on voluntary motion. The jerking or twitching is of individual muscles or groups, not fibrillation, and occurs simultaneously in different parts of the body at approximately the rate of 80 per minute, except during sleep. Constant effort is made to inhibit the movements or restrain them in a measure, so that voluntary rigidity is present. I have been unable to find hypertonus of the muscles with the exception of one case, which also showed patellar and ankle clonus. The jerking in the opposite direction to that in which the examiner is testing, the tonus and the voluntary rigidity may give a false impression of hypertonus. In requesting the patient to remain still, it can be demonstrated that he is able to inhibit the movements for a brief period through effort of the will. The muscles are in an atrophic condition in the late stages of the disease and there are no contractures of the muscles. Electric reaction of the nerves and muscles is unaltered.

The organic reflexes are not altered; the sphincter muscles of the bladder and rectum are only rarely involved. The deep reflexes are markedly exaggerated in all cases. The Babinski phenomenon is not present, although rarely ankle clonus is elicited.

The number of hours devoted to sleep is not characteristic. It is poor in some cases and sufficient in others. Three of the patients state they never dream. The involuntary motions cease during sleep, but begin when the patient's slumber is even slightly disturbed.

Examination of the chest shows a dorsal kyphosis in some cases or lumbar kypho-scoliosis. Rhinitis is sometimes present. Respiration is somewhat interfered with owing to the spasmodic jerking

of the respiratory muscles and there occur hiccough, yawning, barking noises, blowing of the cheeks as well as clicking noises. The ribs are prominent. The number of respirations per minute is about normal. Roughened respiration is frequently heard, as well as dullness at the apices. Examination of sputum for tubercle bacilli is unsatisfactory on account of the lack of cooperation. It may be proper to state here that a tubercular condition of the lungs was found in each of the eight cases at postmortem, as well as some emphysema, edema and hypostatic congestion. Pleurisy or pleuritic adhesions were present in seven of the eight cases. Empyema was present as a terminal condition in two, so that all choreics should have a most careful examination of the lungs for signs of tuberculosis for segregation from other patients and appropriate treatment.

The cardio-vascular system reveals nothing very characteristic. The pulse rate is 70 to 80 per minute, and the pulse tension at the wrist varies. The capillary circulation is fairly good. No evident cyanosis of the extremities. The heart weight averaged about 250 grams. Epicardial fat is absent or gelatinous. There was occasional thickening of the tricuspid, aortic and mitral valves with atheroma, but the valves were normal in the majority of the cases at autopsy.

The Wassermann reaction with the blood serum in five cases tested by Dr. Hough was negative and examination of the cerebro-spinal fluid in one case for Wassermann reaction was negative, its appearance clear, protein content not increased and there were only four cells per cu. mm.

In the digestive tract it is only rarely that refusal of food is noted. In the early years of the disease the appetite is good, later bulimia is notable. The appetite is enormous or ravenous, probably incident to the muscular exertions as in hard laboring men. The usual three meals per day are quite inadequate. Ten or 15 minutes after breakfast one patient will ask, "When is dinner?" Another would eat continuously during the whole afternoon if he had sufficient food to last. Two others grasp at the food of patients sitting nearby and stuff their mouths to the fullest capacity. Meat, etc., must be cut in small pieces to prevent their choking. All the choreics must receive extra diet and the item of food is often mentioned by them. A number require laxatives,

and severe diarrhoea occurred in four cases; another had dysentery. In two of the cases examined for intestinal animal parasites, a mild infection of trichuris was found, but it is probable that this condition was incidental to their very untidy habits in eating rather than in any way related to their choreic disease. There is difficulty in conveying food to the mouth, as well as difficulty in swallowing, and in some cases it is necessary that the nurses feed the patients on account of the extreme incoordination. When the disease is well established, each patient eats as much as three or four normal persons. They constantly ask for something to eat and complain of being starved by the nurses or others.

The examination of the liver shows nothing characteristic, and at autopsy was noted as normal in two cases; there was passive hyperemia in three cases and fatty changes were present in three. The gall bladder was normal in all cases. Examination of the spleen showed nothing characteristic. The capsule was usually wrinkled, and in two cases adherent to surrounding tissues. In another case the capsule was thickened and pigmented and was normal in two cases. The splenic pulp was tough and fibrous in three cases, normal in two and in one was noted as soft. The suprarenal capsules were sclerotic in one instance in a patient whose death occurred at the age of 42.

In the genito-urinary system masturbation was noted in a number of cases. Urinalysis showed no marked abnormality with the exception of an occasional mild cystitis and some increase in urea excretion.

The average weight of the kidneys was 125 grams. The capsules were slightly adherent in four; the cortex thin; small cysts were found in two. The tissue was noted as swollen in two, congested in three and pale in another.

The osseous and lymphatic systems showed no characteristic abnormality.

Onset.—Unless the disease be considered, like puberty, an incident in development, heredity alone does not seem to be a sufficient cause for its onset, as the heredity is the same up to the time of onset, during which the disease is not manifest, and again the same heredity is present in the unaffected brothers and sisters. The onset in children of choreics is usually when they are about five-eighths of the age at which the disease became manifest in the

parent. The average of the ages at onset is $42\frac{1}{2}$ years—the two younger being 26 years old at onset and the two older being 65 and 67 years respectively.

In about one-third of the cases the disease was ushered in by mental symptoms, and in two-thirds of the cases by physical symptoms, beginning in the hands or feet. The mental symptoms began gradually or insidiously and were manifested by untidiness, slovenly appearance, carelessness regarding exposure of the person in public, no evident appreciation of the rights of others, unreasonableness. One patient expectorated on the floor or into dishes containing food; Case 10982 committed an assault and was sentenced to prison; Case 11241 abused his family, accused them of neglecting to properly prepare his meals, thought the food tainted, made attacks on his relatives, ran up and downstairs aimlessly, raised the window and screamed "Murder," became confused and wanted to know what day it was. He was employed in the railway mail and one morning locked the doors of the mail car and refused to receive mail at points designated to receive such. He attacked his brother-in-law and threatened to kill his wife. Case 12004 became hypochondriacal and asserted he was full of red paint and acids, that his arms and left leg were dead. In Case 12211 the onset was insidious; she became unhappy, discontented and distressed, wept a great deal and complained of everything and everybody. She lost interest in her surroundings and neglected her work, and became careless of her personal appearance. At times refused food and spoke of committing suicide. Things dropped from her hands. Case 13923 complained of pains in the lumbar region, which were soon followed by movements in the hands and later in other parts. Case 15313 had led a tramp's existence and visited the Capitol, having in his possession a valise filled with old clothes; said he had influential friends among the statesmen, that he was followed and that his mail was opened and read by the people with whom he lived. Case 16907 claims that the onset followed a fall. He became averse to association with others, inclined toward solitariness, gathered trash and engaged in fights with any one who approached him. He failed to sleep in bed, but slept in a bath tub. The onset was gradual in Case 18077, manifested by jerking in the legs, so that he walked like a drunken man and his wife often accused him of being drunk before the gravity of his

disease was realized, in spite of the fact that he was a total abstainer from alcoholics. His appearance became slovenly. In Case 18607 the onset was gradual and began in his feet after his return from chasing Aguinaldo in the Philippines. A fellow-soldier supposing that the motor manifestations were due to drink, said to him, "You're getting money from home, because you have a 'jag on' every day, and I can afford to get drunk only once a month." He became very careless and dirty in his habits. In Case 18730 the onset was insidious; she always became nauseated riding on the street cars and later was dull and lacking in ambition. She threatened and attacked her mother. Case 19350, an ex-soldier, constantly violated the rules of the Home where he lived. He became filthy in habits, abusive and violent toward his associates. The conduct of another case at the onset was considered reprehensible, and in still another, ideation was noted as confused.

Generally the theoretic views of the patients on conduct were entirely proper, but practically there was a marked incoordination between the views expressed and their consummation in action, resulting in apparent ethical deterioration.

Emotional State.—The emotional state of choreic patients is one which commands attention, as on it is based their tendencies toward action manifested in their behavior. The most frequent and striking type is the childish, petulant, fretful, peevish, cross, irritable, faultfinding, angry, abusive threatening, unsociable, occasionally depressed, selfish individual who has disturbed periods during which the most obscene language is used; when he is restless, has frequent altercations, quarrels and fights. He is noisy at night and generally discontented.

Case 5944 was hypersensitive at first, and later indifferent; 5953 was irritable but not violent. 10982 manifested irritability, varied to depression; later was dull and indifferent. Case 16907 was excessively irritable, dissatisfied, complaining, a chronic grumbler, disagreeable to everybody, abusive—using obscene language and assaulted those who removed the trash from his room. He was very selfish and when manifesting irritability with depression would express a wish that the Lord would paralyze him and take him out of this world. The following is an interrogatory when he was aged 71:

"How do you feel usually?"

"Oh! I feel pretty well—Oh! I'll fall (as a sudden movement causes him to swerve around in his chair)."

"How do you really feel?"

"Oh—well, I am—ah, —oh. I feel like I get weaker all the time."

"Have you any special feelings or sensations in your body?"

"No—not—ho—ho—ch—ch (sounds due to respiratory and laryngeal spasms). I don't have any cramps now any more—I used to have them all over."

"What do you like best?"

"Something to eat do you mean—anything special in the way of a diet."

"What men do you like best?"

"My own children first place, of course—what was that question you asked me? I used to be under—to be under Grant. I think Lincoln was one of the best men—one of the best presidents we ever had. I think Grant was one of the best generals."

"What do you think is the best thing in the world?"

"Oh! I don't know, doctor—what do you think? If I could ever get my freedom."

"What women do you like best?"

"My own daughter, of course—Maggie (nurse) is next. I love Maggie, bless her heart, she has always treated me so well. (He often calls this nurse the vilest names.)"

"What countries do you like best?"

"My own, of course, because I am an American citizen."

"If this country went to war, what would you do?"

"You know what I did do, don't you? I served three years of the best of my life in the —— regiment (during the Civil War)."

In response to further questions, for odors he liked wintergreen; for flowers his preference was geraniums; he stated he liked to hear good music, good singing and religious songs. When asked what he disliked to hear, he replied, "I don't like to hear one swearing." (!!) Patient himself uses the vilest language when disturbed.

"Are you depressed or sad?"

"Oh! I don't know what you mean. Of course, I feel sad because I can't be free."

"Are you afraid or worried?"

"Yes, I'll commit suicide if I can't get my freedom."

"How?"

"Quit eating for a day or two so I will get out of here. I reckon after I am dead you will send me away. I was brought here in the first place against my protest. I am going to commit suicide I tell you some way or another, if I have to knock myself in the head with something."

"Do you think it right?"

"I think I am justified in doing it. That's the best I know."

"Have you reason to complain of anything here?"

"Some here I don't care for—you've got an Irish devil here. He hollers

into me. I hate him because he—oh—ha—iro—ec—click (spasmodic respiratory sounds)."

"Are you in love with anyone?"

"Oh! of course, I really love my own children."

"Do you get irritable with the nurses?"

"No, I never bother the nurses—I do with the patients when they call me names. (He was here reminded that a fellow-patient with whom he became angry had not called him names and when asked why he became angry, replied, 'He was so close to me.')

"Why do you get so angry when the lights are turned on?"

"Oh! I don't know. I reckon it made the twitchings worse or I wouldn't have objected."

Case 18077, in the early years of his disease, was irritable, quarrelsome, abusive to others, had outbursts of temper and appeared nude in the wards or corridors. Later his emotional state was one of quiet contentment, not becoming easily angered. He realized he was nervous and in reply to questions said that he was not sad or depressed. He thought being in the hospital was the best place for him. When asked what he liked best, he replied, "Pies." Appreciated perfumes, and his preferences for colors were red, white and blue. He stated he liked music, enjoyed hearing the Marine Band play and his favorite pieces were "The Washington Post March" and selections from "Tannhäuser." Although formerly leader of a band, he was unable to remember any sentimental pieces of music. His principal desires are found among foods.

Case 18607 was irritable in the early stages of his disease. Later his emotional state is indicated by his words, "I don't let myself bother at anything. I feel fine—never sad. I find it don't pay at all to bother." When asked what he liked best, his chief desire is indicated by the answer, "I like pretty near everything good to eat." The only time he has pain is when a sudden jerk occurs in a muscle not frequently used. This is generally in the legs and lasts three or four minutes. He thinks money is the best thing in the world because it can buy almost anything except health, and he has found out that he cannot buy the latter. He likes his nurses and appreciates their treatment of him, although he states he does not like women. He believes Napoleon was the greatest man, and for statues he likes that of George Washington in the rotunda of the Capitol. His preference for monuments is Grant's tomb, New York. He is patriotic, as for instance when asked what countries he likes, replied, "Little old U. S. I used to be a soldier

under it"; and when asked what he would do if this country went to war, replied, "I guess I'd stay right here—I'd have to. If I was in good health, I'd enlist 'pronto,' that's Spanish for quick." He has preferences and dislikes regarding odors, which may be considered normal. For views, he likes the sea best, and thinks the grandest sight he ever saw was the Pacific Ocean when it was stormy and the ship on which he was crossing was in the midst of the storm. In music he likes everything from grand opera to rag-time if played well, and likes "The Star Spangled Banner" and the music of "The Bohemian Girl." When asked how he liked being in this hospital, he thought it the most desirable place he could be next to the Soldiers' Home; there was not anything unpleasant or that he disliked here; everybody treated him well, and when asked how he would like to be kept here all his life, he guessed he would have to stay, having given up hope of being able to return to the Soldiers' Home, because he is pretty sure he never will be cured. He states he is religious, always good natured and never hated anyone. In reality, the patient of late has no angry spells like the other choreics on the ward, and is not easily aroused to anger even under circumstances which might annoy the average person. Emotionally, he is the opposite of the irritable choreic.

Case 18730, prior to the onset of chorea, was happy and cheerful, later became dull as symptoms became pronounced, and afterward manifested excitement with irritability. Frequently was dissatisfied and said, "I'm so tired of this old place, I don't want to stay here. I hate you all." At times she laughed to herself and stated she felt fine. She manifested but little interest in her environment.

Case 19350 says he is happy, but actually is irritable, saying those about him make insulting remarks. He has made unprovoked assaults and later was indifferent or placid. He thinks that he cannot go among strangers, as they get the impression that he is drunk. His principal object in life is something to eat. He has made no effort to learn the names of those with whom he comes in contact daily, but realizes that he is treated well. When asked how he would like to be kept here all his life, replied, "I don't know. Couldn't do better and wouldn't blame the doctor for keeping me here, but I can work at anything." He is respectful

when speaking of his parents, and although he has made unprovoked assaults, he states he would hate to see anything hurt. His irritable periods are of short duration.

Case 19564 was irritable in the early stage, complaining, frequently cursing and calling the female nurses the vilest names. Samples of his conversation are as follows:

"How do you feel usually?"

"I feel cheerful as a rule, especially when they feed me well."

"What is your mood to-day?"

"I feel very good to-day, because I am thinking about getting a good dinner, then a good supper."

"Have you any special sensations in your body?"

"I have no special sensation. My muscles jerk a little but that is from lack of work."

"What do you like best?"

"Why I like everything that's good to eat. That comes first of all."

"What do you like to see best?"

"At present I always like to see something 'sitting' before me to eat."

"Is there anything you feel sorry for or grieve about?"

"No, it is no use to feel sorry or to grieve, as long as I can eat and lay down to sleep well."

"Is there anything you feel proud of?"

"The only thing I feel proud of is my meals."

Case 19801 was rather indifferent toward his surroundings; stated he felt neither happy nor sad; did not worry, and his chief desire was "enough to eat." He became excited easily, then talkative and said he would scalp someone.

In Case 11561, a female, the emotional state was one of depression.

Case 12004, in the early stage of his disease, was hypochondriacal and depressed. Later was stupid and indifferent.

Case 12211 was despondent and hypochondriacal at the onset, exaggerated her ailments and had depressed periods. Again she was irritable, faultfinding, complaining, more emotional and excitable when given slight cause, was childish and wandered at night. Became irritated by a light or by the sound of the piano. Her mood was variable—from being cheerful to contrary, quarrelsome, scolding or crying.

Case 13923 was stubborn, at times depressed, rarely pleasant, but oftenest indifferent to her surroundings.

Case 15313 was not excited but usually stupid, indifferent or unconcerned. A sample of his conversation showing facetiousness is as follows:

- "What day is to-day?"
 "A-B-C."
 "How old are you?"
 "Did you talk to me or the Bible Class—old enough to vote—twenty-one—twenty-one." (Perseveration.)
 "How do you feel?"
 "Pretty well—yes sir, yes sir, yes sir (in a flippant manner)."
 "Why are you here?"
 "Insanity."
 "Are you married?"
 "I had a good home but I left."
 "What is your profession?"
 "Post-office thief."
 "Where were you born?"
 "Picturesque, Cork."
 "What places have you visited?"
 "Germany."
 "How long since?"
 "Where does my whereabouts come in—came Berlin."
 "Do these motions make you tired?"
 "Tired of living."
 "How do you feel usually?"
 "Was ja. Was ja."
 "Why do you seem to be nervous?"
 "Yes sir, yes sir, yes sir."
 "What countries do you like?"
 "Germany, Germany, Germnay."
 "What do you like to hear?"
 "I ain't got time, I ain't got time, I ain't got time."
 "Does everybody treat you well?"
 "Yes sir, yes sir, yes sir."
 "If this country went to war, what would you do?"
 "Fight like hell, run like hell and be damned."

This patient's mood is rarely facetious. His greatest desire is to eat anything edible. When abused by fellow patients he manifests no resentment, but gets out of their way as best he can.

Case 19882 was depressed, stupid and occasionally irritable. Later she was indifferent.

The latter cases represent the second type of emotional state found in choreics—one that is placid, apathetic, indifferent, stupid or stubborn and in which confusion, depression or mild irritation

is present at the onset and is transient. The depression in either form is not as great as is popularly supposed and the majority of patients do not worry about their fate.

Are the mental states characteristic? They appear as characteristic for chorea as, for comparison, the various mental states in paresis or senile dementia in those diseases, and the varieties are less numerous than in either of those entities.

Mentation.—The stream of thought is superficial, at most mediocre, and never reaches the high type present in paranoiacs. The mental mechanism is simple, immediate and direct, similar to that of a child, not deferred nor high grade. The mental attitude is apparent in those who deny that there is anything wrong with them. Deterioration is manifested in the early stage, mostly in the ethical sphere. Poverty of ideas and vagueness in expression and failure to complete sentences occur. Olfactory and visual hallucinations are as a rule denied. Auditory hallucinations were present in three cases in the early stage and in nine of the cases were never manifest or denied. On the whole, hallucinations have not been prominent in any of the cases. Case 11241 "heard" voices abusing him, and thought his friends and family were plotting to injure him. Case 19350 says he hears voices making insulting remarks about him and thinks these remarks are made by the patients about him.

Delusions.—At the onset delusions of persecution were frequent, one patient (15313) asserting that he was followed, and that his mail was opened and read, early stage; another, that enemies were lying in wait for him. One female (13923), at the beginning of her psychosis, stated that the soul of her dead sister had entered into a pet bird and conversed with her through the medium of the bird's voice, which she could undersand, and thought that the bird understood her. Delusions regarding the fidelity and chastity of their wives were present in two married cases but these delusions were not prominent during the course of the disease. They serve to illustrate upon what material delusions are sometimes based (the usual content of consciousness), no delusions regarding fidelity or chastity being present in the unmarried. On the whole, delusions were not prominent, and in some cases it was difficult to determine whether the supposed delusion was not merely an erroneous belief based on poor critique or judgment impairment.

The delusions of the choreic were more frequent than hallucinations and as a rule were not based on hallucinations. The character of the delusions in a number had a religious coloring. Delusions were feebly upheld, transient, and seemed more like misinterpretations of actual occurrences—a childish, hyperirritable reaction. None were noted in Cases 5953, 6623, 10982. Case 11241 had persecutory delusions in the early stage; none were present later. Case 12004 had persecutory delusions in the early stage and claimed he was full of red paint and acid. Case 12211 had delusions of persecution in the early stage, later none were manifested. Case 16907 thought the people around were making fun of him and accused others of having taken his money. No delusions were noted in Case 18077, although tested for frequently. No delusions could be elicited in Case 18607. No delusions in Case 18730. Case 19350 had mild persecutory delusions based on auditory hallucinations in the early years of his disease, and often asserted that the attendants were drunk and that he had previously known people whom in reality he only had met here. His mistakes of identity may have been partly due to his poor vision. Case 19564 believes surgeons and others conspire to take his life and asserted that a strong box containing many thousands of dollars had been stolen from him, doubted his wife's chastity and believed people laid in wait to do him bodily harm. He asserted that President Taft, Rockefeller and Morgan had robbed him, and said that the President was sitting in the White House chair wearing his clothes. Case 19801, when excited, said he was an Indian. His current of thought was loose and indefinite. Later he denied that he was an Indian. Case 19882 talked or mumbled vaguely after the manner of a feeble-minded individual. No false beliefs were obtainable other than that her relatives were against her, and that she was to become wealthy by inheriting her father's pension. The delusion or false belief of the married men to the effect that their wives were untrue, while no such idea was present in the single men, illustrates that the delusional mechanism may be present in both but the content or form of the delusion is based on something already in the mind.

Conduct.—The behavior of the choreic is usually the cause of his commitment to a hospital for the insane, where the simple life therein can be more easily conformed to and where only the

slightest, or no effort at adjustment to the environment on the part of the patient need be made. Case 6623 while in the hospital was violent under excitement and scolded, using vulgar language. Case 10982, convicted of assault and sentenced, had altercations in the hospital; he was slovenly and stupid in appearance and later was destructive to clothing by tearing it. He had disturbed periods; continued to make unprovoked assaults and was untidy. He would kick the door senselessly during the whole day, and on becoming bedridden would attempt to get up and fall to the floor, so that he required constant attention. Case 11241 laughed and talked to himself in a silly, childish, incoherent manner; failed to answer questions correctly and repeated over and over anything he desired to say (perseveration). Case 11561 would not remain in bed, although unable to maintain the erect posture; at times became very much disturbed, cried and continually asked for something to eat. Case 12004 had excited periods; was unable to sit or stand quietly; stared vacantly; laid lazily around on the floor and gathered trash. His clothing was always unbuttoned and tended to fall off. He resented the presence of other patients near him. Case 12211 failed to associate with others, was unsociable; remained half dressed, objected to changing her clothes or to taking a bath. She was unable to comb her hair or button her clothing. She collected brooms, dust pans, blankets, sheets, soiled clothes, rubbish, etc., carried them to her room and denied having them. Case 13923 was childish, faultfinding, rarely talked; her habits were untidy. The left side was most affected and she often had falls. The attitude of Case 15313 was flippant; he was untidy, unkempt, an eloper from the hospital; made efforts to steal from other patients and stalked around among them good naturedly, collided with them and aroused their anger. He often failed to answer questions. Case 16907 complains of the cold even on warm summer days and wants the windows and doors closed, but will not keep his body covered. He throws himself about the bed entirely nude; has made attempts to elope from the hospital, saying that he cannot endure being here any longer. He beats his head against the wall or strikes himself with a cuspidor in efforts at suicide. He keeps an untidy room, is a trash-gatherer, collecting dirty towels, old rags, tin cups, glasses, dishes, food and drink, and is quarrelsome when effort is made to clean the room, and

again assaults others without provocation, and is inconsistent in that when questioned regarding his actions he states theoretically what would be proper. Case 18077 is unable to dress without assistance and is very untidy, spilling food and drink on his clothing, and although his motions are markedly incoordinate, he prefers to feed himself. He tries to answer all questions, but is rather indifferent to his environment and self-contented. Case 18607 responds normally to the salutation "good morning," "good evening," etc., and when he desires anything is most persistent in his requests. He is interested in the daily news, reads the newspapers and would smoke all day if allowed. He enjoys visits from his friends and is usually interested in his meals long before they arrive, and never fails to request extra diet. His appearance is untidy; he allows his clothing to hang "half on," and in eating spills food and drink on them. At times he is a little contrary or impudent. On one occasion he dropped all the dishes from his table to the floor, breaking them, and to his nurse said, good-naturedly, "Now I'm done." He relates that once he had a bonfire before coming to the hospital; he accidentally dropped a match on the bed and set it afire. On a later occasion he attempted the position of waiter in a large dining room. His first duty was to remove a pile of plates from one place to another. He started to remove the pile of plates and dropped them all. Says, "I didn't hold the job five minutes." Case 18730 is untidy, spills food on her clothing; requires to be spoon-fed by the nurses and requires assistance in dressing and undressing. Occasionally she is generous and offers to assist. At times she laughs and mumbles to herself incessantly for long periods. Case 19350 often attacked attendants and had two fights with fellow-patients in the course of a month. Again he talks in gruff tones, orders the nurses away, curses, and on one occasion struck a female nurse. His irritable periods are of short duration and he is pleasant afterwards. His appearance is untidy and slouchy, he fails to fasten his clothes properly; his habits are filthy. Walks to and fro restlessly and mistakes identities; sometimes he asserts others are robbers and are drunk. Case 19564 was averse to those about him, threatened; asserted he was ill treated; exaggerated his ills, but at times was pleasant and friendly, varying quickly to irritability. At times when spoken to he replies in a smiling, mildly impertinent manner

and answers questions curtly or will reply, "None of your business." He has attempted violence upon persons who opposed him. Case 19801 becomes excited easily, is very talkative; claimed he was an Indian and would scalp someone. Another case when spoken to on hearing physician say "Good morning," responds, "There is no good morning for me." When the lights are turned on in the ward for any purpose he will say in a moment, "Turn out those lights." The following moment he says, "Turn out those G—d d—n lights." He frequently requests to be returned to another ward, but on the many occasions when his wishes were complied with he almost immediately desired another change. One case was noisy at night for a long period; 19882 was personally untidy; gathered trash and hid it; a number refuse all medication, claiming there is nothing wrong; assaults are made impulsively on slight or no provocation. Only one female case was violent. On the whole homicidal tendencies were more prominent than suicidal, being present in seven of the men; 11 were not homicidal. As regards suicide, only two made suicidal attempts; 17 were not suicidal.

Attention.—The attention is often defective, many evidences of inattention being noted in a casual conversation. In a number the attention is obtained with difficulty and cannot be well held by the examiner, as the patients tend to wander from the subject on hand and talk irrelevantly. In Case 12004, after 10 years' sojourn in the hospital, no reply was made to questions, although comprehension was present and the patient was still able to talk. Case 12211 cooperated well and her attention, judged by her responses to special tests, was good, although the disease had been in progress approximately 15 years. Case 13923 was able to recognize her friends, although the disease had lasted 10 years. Case 15313 made no effort to cooperate in tests for attention and was unconcerned regarding his surroundings. Case 16907, during the periods in which he is in a good humor, cooperates to a limited extent in the examination. He remembered an address, 375 Oxford Street, as 900 and something. When urged to try and remember, he replied, "300 and something, I think you said," and was unable to give the street. He does not know the examiner's name, although having seen him daily for about a thousand times. Says, "As long as you have been here, doctor, I never learned

your name—never have. I guess it's 'cause I didn't ask the name, I reckon." He is correct in believing that the ward on which he is located is downstairs and thinks there are 100 beds in the ward (36 correct). He does not know his charge nurse's name, but knows the names of the other two nurses on his ward. He was informed the nurse's name and remembered it five minutes afterwards. He was unable to relate any of the current events going on in the world and did not know who was president. He realized that Roosevelt had been president. At the time of this examination he was not aware that a monument was being erected to the memory of Columbus in this city and did not know about the Titanic disaster; the last one he remembered was that of the *Maine* in Cuban waters. He expressed no sorrow on hearing of the great loss of life and was indifferent in his response when asked if another ship nearby should have rendered assistance. A series of "sixes" were read to him by the examiner, containing 24, and he was urged to count them. When asked how many there were, he replied, "Guess you said them all. How can I tell? Guess 25 or 30." His efforts at tapping average about one per second—about one-seventh the normal number.

In Case 18077 cooperation was good. He was given the number 387 to remember and one minute later was given 385 Oxford Street. He replied immediately, "I can't do it," and was unable to tell the first number given. He did not know the examiner's name, although he had seen him daily for five months, and on a number of occasions there were long interviews. The number 387 was again given him and when asked for two minutes later he made no response. On again being asked, he replied, "I don't know." He was asked, "What do you think it was?" and replied, "387." He remembered Oxford Street, but denies remembering the number of the street. He does not know the nurses' names on his ward and underestimates the time between our last interview and the present. He was given the nurse's and physician's names to remember and instructed to remember them five minutes. In two minutes he was able to give the nurse's name, but could not give the examiner's name, nor state what letter it began with; replied incorrectly, "W— I don't remember." He thought there were 30 beds on the ward (40 correct). Did not know the charge nurse's name and when asked why not, replied, "Never interested

me much." He had not acquired the name of any patient or supervisor, but knew Dr. White was superintendent. He reads the daily paper and mentioned the Italo-Turkish war, the latest disaster, the death of an admiral and an aviator. In tapping with pencil he made only about one dot per second—about one-seventh the normal number.

Case 18607 cooperated readily, although at times was stubborn. He was given the number 387 and instructed to remember it, but failed to do so for one minute. When asked why he failed, he replied, "I never had a good memory; can't remember numbers." He remembers where he first saw the examiner, the subject of our conversation on that occasion and its duration. He was again asked the number and replied, "Number got away." "What do you think it was?" "212." He remembered the words, "book" and "eagle" for five minutes. He thought there were about 150 patients on his ward (37 correct); realized that the ward was located downstairs, and when asked the examiner's name, replied, "Got me; I don't know. I never did have a good memory for names. Can't remember names—never could." The only physician he knew here was Dr. White, Superintendent. He said, "I never could remember names since I was small. If I got an introduction to a man or a lady, it was gone from me in about a minute." He knew the name of one nurse on his ward, approximately the name of a second, but did not know the third nurse. When asked how many doors in his ward, he overestimated; said, "About 50" (11 correct). He knew the general arrangement of the ward but the names of only two patients. This patient knew of the events going on in the world, as the Italo-Turkish war, the winner of the baseball pennant, was interested in politics. This patient's tapping time was only 10 dots in 10 seconds.

The attention of Case 18730 was defective; she had not learned the names of any nurses or physicians, did not cooperate in the examination and answered irrelevantly to a number of the questions, although her good education would lead one to expect better answers.

The attention in Case 19350 was defective and a number of his answers were irrelevant. He could not tell who was president, but named a former president.

The attention of Case 19564 was fair, although at times he failed to cooperate. In Cases 19801 and 19882 attention was poor, difficult to obtain and hold, with unconcern.

The attention is variable or impaired in many choreics, and at times may not be obtained if the patient happens to be in a stubborn mood. Kattewinkle, who wrote on this phase, states there is inability to concentrate the attention, but in the previous instances mentioned the defect in attention appears to be due to lack of interest or concern—indifference, although the answers in one case indicate loss of the power of concentration. The attention was increased on matters of interest to the patients, as the time for meals, the amount of food and conditions on the ward, as the amount of air and light, which related to personal comfort.

Retention.—The retention in choreics shows impairment of varying grades; was poor in Case 10982 and Case 11241. In Case 12004 it was good in the early stage and later his responses were incorrect. In Case 12211 the retention of stories was poor. For example, when given the following story and requested to reproduce it, she replied, "I can't recall the story now."

"Cowboy Story: A cowboy from Arizona went to San Francisco with his dog, which he left at a dealer's while he purchased a new suit of clothes. Dressed finely, he went to the dog, whistled to him, called him by name and patted him. But the dog would have nothing to do with him in his new hat and coat but gave a mournful howl. Coaxing was of no effect, so the cowboy went away and donned his old garments, whereupon the dog immediately showed his wild joy on seeing his master as he thought he ought to be."

Her retention of old impressions, as judged by answers to questions on personal history and school knowledge, was impaired. When given the Masselon test, her response was, "I can't remember what you said." She was unable to recall the holidays.

In Case 13923 retention was impaired, as was the condition in Case 15313. In Case 16907 retention of old impressions as judged by his answers to the questions on family and personal history was good, although he stated that his memory was always poor. He was given the following calculation problem: I had 50 cents and spent 12 cents for fruit, 7 cents for butter and 10 cents for bread; How much change did I get? He was unable to remember the problem and stated incorrectly, 10 cents would be left. Again the problem was read to him and he figured, "12 and 7, 19; 10 for

bread, about 29," and when asked how much there was left, replied, "About a quarter (25 cents)." He named the days of the week forward correctly, and when asked to name the days of the week backward began, "Friday, Saturday, Sunday, Saturday, Friday, Sunday. Oh! you get me mixed up. Saturday, Friday, Sunday." The longest river in the United States he said was the Mississippi, over 4000 miles long. The most noted president, Lincoln. The largest cities are London and New York. He was given the following story to remember and reproduce:

"Gilded Boy Story: It is related that at the coronation of one of the popes about three hundred years ago a little boy was chosen to act the part of an angel and in order that his appearance might be as gorgeous as possible, he was covered from head to foot with a coating of gold foil. He was soon taken sick and although every known means were employed for his recovery, except the removal of his fatal golden covering, he died in a few hours."

When asked to repeat it, he replied, "I don't know anything about who it was—well what is it—who was the boy? (irritably)."

In Case 18077 the retention of old impressions regarding family and personal history, as well as school knowledge, was fair. He was given a calculation problem, but was unable to repeat it. He was unable to repeat a number of four digits forward and backward and failed completely in effort to repeat a number of six digits forward and backward. He was able to give the essentials of the Cowboy story. On being given another story, he introduced a number of irrelevant statements, apparently with the intention of filling in. His rendition was very inaccurate, although he was able to give a part of the closing sentence. The story is as follows:

"Shark Story: The son of a Governor of Indiana was first officer on an oriental steamer. When in the Indian Ocean the boat was overtaken by a typhoon and was violently tossed about. The officer was suddenly thrown overboard. A life preserver was thrown to him, but, on account of the heavy sea, difficulty was encountered in launching a boat. The crew, however, rushed to the side of the vessel to keep him in sight, but before their shuddering eyes the unlucky young man was grasped by one of the sharks encircling the steamer and was drawn under the water, leaving only a dark streak of blood."

His reproduction was: "A captain of a White Star Liner had a friend who was first officer. This friend made a trip with the captain. He was on his vacation. A wave swept him overboard and all there was left was a stream of blood and the shark." The

patient was given the same story 22 months later and his reproduction of it shows further impairment of retention, as follows: "A shark killed an officer in the sea—Atlantic Ocean—first officer of the steamer; a crane knocked him overboard." He was given the 50-cent problem and requested to reproduce it. In one minute he replied, "I don't know." The problem was again read to him and he replied, "Too much for me." When this patient sends a messenger to make purchases, if he is handed 5 cents change and asked whether it is the correct amount, he invariably replies, "Yes," irrespective of the amount which he should receive.

The retention in Case 18607 showed but little impairment. Impairment was present in Case 18730. She was able to name the months forward correctly, but was unable to give them backward. The retention was poor in Case 19350. When given the Cowboy story and requested to reproduce it, his answer was: "A cowboy and a dog—he didn't use the dog good—that's all I recollect." He was unable to name the days of the week or months of the year backward, but could name them forward. He could only repeat three digits forward after the examiner, but could not transpose them. He makes mistakes in the identity of persons. Impairment was present in Case 19564. When requested to reproduce stories, he replied, "I can't tell you." He excused his inability by stating that he couldn't remember on account of having been locked up. He admitted that he could not answer the calculation problem. He was unable to name the days or months backward, but could name them forward. He failed in transposing figures. The retention in Case 19801 was poor. When asked to reproduce the Cowboy story, he replied, "He was lonesome like a good many people and didn't know just what to do." He failed to remember an address two minutes after it had been given him. He was able to transpose numbers of three digits, but failed in numbers of four or more digits. He was unable to name the months backward. Case 19882 was unable to repeat numbers of four digits, and when given a number of three digits to transpose frequently asked what the digits were. The difference between a horse and an ox was asked twice, to which she replied, "There is quite a difference between a horse and—what did you call the other?"

Memory.—On account of the defective attention, upon which retention and memory largely depend, there is usually demonstra-

ble memory impairment, but in the three cases occurring in the sixties the memory impairment was not as marked as in cases of senile dementia at that age. In Case 10982 the memory was imperfect. Case 11241 recognized that his memory was not as good as usual and bought books on memory culture. He forgot his mailroute and when changed to a new one was totally incompetent. There was impairment of memory in Case 12004 after the disease had been in progress for six years. In Case 12211 events of her youth were well remembered, but she was unable to give the time of onset of her illness or its development. Special memory, as the date of the Civil War, the names of generals who fought therein, the names of European and Asiatic countries and their capitals, were remembered; the names of the Great Lakes she gave as Michigan, Ontario, Erie and Ontario—repeating one name and omitting two. The last five presidents she named as Taft, Roosevelt, McKinley, Hancock (incorrect). She was unable to recall the holidays with the exception of three. Case 13923, memory was very poor for both remote and recent events after the disease had been in progress five years. Memory in Case 15313 was poor. In Case 16907, in whom the onset occurred at the age of 65, the memory for remote and recent events was good. He knew what time in the afternoon he came to this hospital, how he came, how long he was coming, what was done for him on admission, the wards he had been on since admission, etc. He named General Grant and Sherman as two generals in the Civil War, was able to name the capital of his native state and of the United States, knew who the preceding president was and named the wars which the United States had as the Revolutionary War, Mexican War and Civil War. This examination into his memory occurred when he was aged 69. The memory in Case 18077 is fair, although he is unable to state in what year he was born. He could not give the date of the Spanish-American War, although he enlisted during that war. He was unable to give the name of two generals and could not give the date of his admission here, but replied in a general way, "Four or five months ago," approximately correct. In Case 18607 special memory was good; he was able to tell by one week the date of entrance to this hospital, but stated correctly that he came about noon; could tell how he came, how long he was coming and with whom. He was able to tell what was done for him on admission,

knew where he was before coming here. Gave correctly the items of his last meal and remembered who had been to see him. Objective tests of his memory showed but little impairment, although he stated his memory was poor. Case 18730 was noted as forgetting easily and did not remember former occurrences after the disease had been in progress five years. There was some impairment in the memory for events of his past life in Case 19350. He was unable to tell what presidents were assassinated and was unable to name but four of the seven most widely celebrated holidays. Case 19564, in whom the onset occurred at 67, showed general memory impairment. He also failed to remember what presidents were assassinated. He was unable to remember the names of his five children. Case 19801, on being asked, "When was the Civil War?" replied, "1905 or '04." He was unable to think of the presidents who were assassinated, nor did he know who the preceding president was. He could name only two holidays. He could not state correctly where he came from prior to his admission here, and remembered only one patient accompanied him, whereas 15 were actually in the party. Memory impairment was present in Case 19882.

The estimate of the duration of time was erroneous in many of the cases, being underestimated more frequently than overestimated.

Intelligence.—The intelligence is impaired in a number. In Case 10982 there was some impairment. Case 11241, there was impairment with mental dullness and failure to answer questions intelligently. Little information could be obtained from him, and he was unable to recognize his relatives in the year prior to his death. There was impairment in Case 11561. In Case 12004 intelligence was also impaired, he mumbled frequently to himself and failed to answer questions as a rule, although it was evident that he understood them. Case 12211, although having had a good education was rather childish; her school knowledge was not commensurate with her educational advantages. On being given the Masselon test (the incorporation of words as pen, ink, letter, etc., into a sentence) she replied, "I can't remember what you said." She was unable in the Ziehen test to give any of the differences between a horse and an ox, merely said, "There is a great deal of difference." She was unable to solve the 50-cent problem.

She was unable to explain the meaning of proverbs (Finckh test). On being asked the meaning of "The rolling stone gathers no moss," her answer was, "Don't know." "The early bird catches the worm," was explained, "It means early bird catches the worm in every respect." "Too many cooks spoil the broth" was explained better. In Case 13923 intelligence was of the childish type, practically helpless, as was also the case in 15313. In Case 16907 intelligence was really fair on the more important events, almost commensurate with his educational advantages. He was unable to solve the 50-cent problem correctly. In Case 18077 mental reduction was not readily apparent. Although born in England, when asked to name three European countries, he gave London, Manchester, France. In naming the months he omitted April and May. In calculations on addition, subtraction, multiplication and division his errors approximated 60 per cent, although he attended high school in New York City. He was unable to incorporate words into sentences and failed to give the meaning of proverbs. There was only slight impairment of intelligence in Case 18607. In Case 18730 intelligence was impaired. When asked who freed the slaves, she replied, "Booth," although having had a good education. In response to questions, she replied Washington discovered America; was unable to name the longest river, nor could she give the names of three European countries. She failed to give any differences between a horse and an ox, merely responded, "Both walk, one plows, one works for a living, one works on the farm." When asked the difference between a lie and a mistake, her inadequate response was, "People lie about you." "Burning the candle at both ends" had no meaning to her other than "Light both ends." She did somewhat better in a number of other proverbs. Case 19350 was unable to incorporate words into sentences, nor could he do the arithmetical problems asked him. He did not know the largest river in the United States, nor could he name the capital of his native state. Case 19364 was unable to incorporate words into sentences (Masselon test), and when asked the difference between a horse and an ox, he replied, "I don't know any difference." He was unable to do simple arithmetical problems, saying he used to be very good in arithmetic but had forgotten it; he had had a common school education. To the Finckh test (explanation of proverbs) he said he did not know

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the meaning of them. The responses to the Special Intelligence tests in Case 19801 were fair about five years after the onset of the disease. The intelligence in 19882 was of the feeble-minded variety.

In a number thought is slow and there is difficulty in thinking. The intelligence impairment is not always evident, and the cooperation of the patient is obtained only with difficulty for many of the tests.

Judgment and Insight.—Judgment and insight are impaired in a number, as for instance in those who deny that there is anything wrong with them, or ascribe the condition wholly to some disease, such as pleurisy, which may be coexistent. Their estimate of the ages of persons with whom they talk is often very much exaggerated.

There was impairment of judgment in Cases 6623, 10982, and 11241, manifested in the latter by his failure to properly attend to his duties, and later his variable behavior, laughing and talking to himself in a silly, childish manner or swearing at every one in sight. Judgment was impaired in Case 11561. There was judgment impairment in Case 12004; although realizing he was nervous, he thought his condition warranted his being out earning a livelihood. Stated he liked to make the choreic motions and would not care to cease making them. In Case 12211 judgment and reasoning were only fair; insight was lacking regarding her mental condition. When asked whether there was anything the matter with her mind, she replied, "No, indeed, I hope not. I feel alright. I see all the beautiful things of nature now." The reasoning and judgment were very defective in Case 13923; she was feeble and practically helpless mentally. Judgment was much impaired in Case 15313; he believed his "shakes" were due to being deprived of tobacco, although he was given a sufficient quantity of the weed. Case 16907 was lacking in insight. For instance, when asked whether he had St. Vitus' dance, he replied, "Oh! no. There is nothing the matter with me." He denied having seen any patients with motions like his, although he was one of seven on his ward. He denied having had excited or angry periods, which were so evident to those about him. The following are his responses to some questions:

- "For what cause were you brought here?"
- "They didn't ask me any questions. They just made me come or I would not consent to come to this place."
- "For what purpose were you brought?"
- "They never asked me whether I was sick or well. I have no idea why they compelled me to come to this hospital."
- "Did you get along alright at home?"
- "I got along alright. I was agreeable with my wife and children."
- "Why are you here?"
- "I don't know. I know it is against my will, for I know I was not sick."
- "Were you sick or nervous?"
- "No, I don't think I was, although I am shaky."
- "What do you think of your condition?"
- "Physically, I am growing weaker from one day to another. Mentally, my mind holds out pretty well; I think I am alright."
- "Has there been a change in you?"
- "All the change I know, I feel weaker."
- "Have you been out of your head?"
- "Only when I got a fall from an apple tree. Never was insane. Of course, not."
- "Do you remember attempts at suicide?"
- "Yes, I beat my head on account of noise made by another patient."
- "What do you intend to do?"
- "I want to live by myself. Then I will farm."
- "What do you think of the coming election?"
- "Would rather see Taft elected than Roosevelt, as he is a very good man and Roosevelt was in several terms."
- "Do you think this hospital for the insane is the right place for you?"
- "No, I don't, because I have no freedom here and what I want is freedom."
- "Was it right to send you here?"
- "No, it was not for it was against my will."
- "What would you do if you found a house on fire?"
- "Do like I always did—try my best to put it out."
- "Why should a person save some money instead of spending it all?"
- "For future use."
- "If someone has done something you don't like and says he is sorry, what is the right thing for you to do?"
- "I would forgive them."
- "Why should you forgive an injury done in anger more quickly than an injury done in cold blood?"
- "An injury done in anger is not as bad as one done in cold blood."

In Case 18077 judgment was impaired; insight was lacking regarding the mental change, but present to the physical change. There was only slight judgment impairment in Case 18607. Insight was lacking regarding his mental defect but was present regarding his physical disease. In Case 18730 judgment

impairment was also present. When asked what was the trouble, she replied, "Typhoid." On another occasion she denied that there was anything wrong with her and asserted her mind was good. Case 19350 had judgment impaired; insight was lacking absolutely. He did not believe he was insane and did not think there was any occasion for his being sent to this hospital, and stated he felt as good as he ever did. He denied having made assaults mentioned in his history; asserted that he always acted right and did not know for what purpose he was brought here. He did not want to come, as he heard them talking about an asylum. He thought that he was here because he didn't have money and could not get work, as people thought him drunk on account of his walking like a drunken man. He said he would practice inhibition of the movements for about \$1 per day. He denied having strange thoughts or having imagined things. Asserted when he did queer things, it was because the patients bothered him, as when he bit a fellow-patient's finger. He considered his mind was alright, that it was as good as formerly, and was in the hospital because people accused him falsely. He did not think a hospital for the insane was the right place for him and did not consider it was right to send him here. If he found a house on fire he would try to help put it out; he thinks people should save money in order to have some when they get sick; if someone injured him and was sorry for it, he would say he was sorry too; he thought an injury done in cold blood worse than one done in anger. If one had committed an injury that could not be righted, he thought it best to let it go and in Heaven it would be settled. In criticising some illogical sentences, the following are his responses:

(a) All roses are beautiful; lilies are not roses, therefore, lilies are not beautiful. "All roses are beautiful but lilies are beautiful too. Therefore, it is not true."

(b) Nothing is better than wisdom; dry bread is better than nothing. Therefore, dry bread is better than wisdom. "I think dry bread is better than wisdom, because I can eat it when I am hungry and I never tasted wisdom."

(c) Repentance is a good quality; wicked men abound in repentance and, therefore, abound in what is good. "Repentance is a good quality but wicked men do not abound in repentance and what is good."

(d) The object of war is durable peace. Therefore, soldiers are the best peacemakers. "The object of war is durable peace. In the Civil War they

fought to free the negroes, so the women and children could have peace. Therefore, soldiers are the best peacemakers."

(e) No soldiers should be brought into the field who are not well qualified to perform their duties. None but veterans are well qualified to perform their part and, therefore, none but veterans should be brought into the field. "I think young soldiers are as well qualified as veterans and ought to be brought into the field."

Judgment was impaired in Case 19564. He did not think anything was wrong with his mind; believed he was sent here so "they" could have a good smoke and a little more whiskey. The reason he supposed he was sick is because he was kept locked up, as "they" were waiting for him to die. He believed he could think as well as formerly and would not consider that he was in a hospital but rather a prison, as he was kept locked up. He denied having strange thoughts at present but admitted having had them, and imagined, he stated, that people took his shoes, clothes, etc. When asked what he thought of his condition, physically and mentally, he responded, "My condition is much better and my appetite is good and I can eat three times a day. I have no fears and am not afraid of anything." He responded well to the abstract questions as to what should be done under certain given circumstances, and his responses to the illogical questions were concise and approximately correct.

In Case 19801 insight was lacking regarding his mental and physical condition. He denied being sick and did not think there was anything wrong with him. Judgment was also markedly impaired in Case 19882. Her lack of insight is shown by the remark in response to the Masselon test, "Well, I might be nervous, but there is nothing crazy."

Orientation.—The orientation often is impaired as regards time, place and person after the disease has been in progress a number of years. In Cases 10982, 11241, and 11561, it was lost late in the disease. Case 12004 was oriented to time and person, but disoriented regarding place. Case 12211 was oriented to time and place, but disoriented to persons. Case 13923 was oriented to place, but disoriented to time and person; the identity of self was not lost until late. Case 15313 was oriented to place at the beginning and until late, but was disoriented for time and person. Case 16907 at the age of 71 knew the month and year, but not the day or date. He was oriented to place and person. Case 18077 was

oriented to time and place and knew the class of patients in the hospital, but had not acquired any names. Case 18607 knew the month and year, but not the date. He was oriented to place; realized that fellow-patients were insane and was able to give the names of a number correctly after his disease had been in progress for 10 years. Case 18730, disoriented to place; inaccurate as regards time, said it was 1907 and the month April in August, 1911; she was unable to name the day of the week. She recognized physicians and nurses as such, but had not acquired their names. Case 19350 was approximately oriented to time; knew the year and month, but not the day or date. He was disoriented to place; thought it was Dayton, Ohio, but realized he was in a hospital for the insane. He recognized the patients as such, but had not acquired the names of physicians or nurses, and made mistakes in identity. Case 19564, on December 19, 1911, gave the following answers:

"What day is this?"

"I don't know whether it is Tuesday or Wednesday."

"What time of day?"

"Morning" (correct).

"What month?"

"October" (incorrect).

"What date of the month?"

"I don't know."

"Is it beginning, middle or end of the month?"

"I think it is near the beginning of the month."

"Is it summer or winter?"

"Winter."

"How long have you been here?"

"I came here October 5, 1911." (December 6, 1911.)

"What year is this?"

"1912" (1911).

"What place is this?"

"I don't know whether it is a jail or hospital."

"What is this building and its name?"

"I don't know."

"What city is this?"

"Milwaukee." (Washington, D. C.)

"Who are these people (patients)?"

"I don't know."

"Why are they here?"

"Because they are sick."

"In what way?"

"Some of them are crazy and some are here from getting drunk and fighting."

"Do you know the names of any of them?"

"No."

"Who are your physicians?"

"I don't know their names."

Case 19801 on March 29, 1912, gave the following replies:

"What year is this?"

"1912" (1912).

"What month is it?"

"November" (March).

"What date of the month?"

"Twenty-fifth."

"What day of the week?"

"Tuesday" (Friday).

"What place is this?"

"Leavenworth, Kansas." (Washington, D. C.)

The patient had not acquired the names of any of those about him, but realized that they were patients and nurses. He believed his home was only a short distance away and could be reached in a few minutes, whereas the distance was really over 2000 miles.

Case 19882 knew the name of this hospital and said she visited her brother here (Case 11241). On May 14, 1912, when asked the year, said, "This is 1900. No, ain't it 1904? I didn't look at the month. I forget the day." She had learned the name of one nurse only. Her estimate of the duration of time was erroneously increased.

Course.—The course is chronic and slowly progressive, the patients changing little from month to month or from year to year, unless acute illness intervenes, but deterioration in the mental sphere surely occurs, ending in dementia. The patients are ever restless and must be kept secluded in a room from time to time on account of their irascibility towards others, and as they are unable to keep their bodies covered, all efforts to do so being futile; and as they frequently destroy their clothing or disarrange their beds, they must be separated from the better-behaving class of patients. It becomes impossible for them finally to remain in bed on account of the muscular manifestations and their rolling from side to side in the bed. As at this time they are usually unable to stand erect, falls to the floor are more frequent, and it is necessary, in order to avoid serious injury, that the patient be placed in a bed on the floor with two or three mattresses about the beds to prevent inju-

ries. The patient becomes bedridden, the constant jerking and rubbing produces irritation of the skin and finally ulcers appear at the elbows, shoulders, over the sacrum and vertebral prominences; it is well nigh impossible to keep dressings on these ulcers. A tendency to furunculosis is present in a large number, but there are no complaints of pain or suffering. Their habits have become most untidy and filthy with the spilling of food and trash-collecting. A transient increase in weight is rare. Atrophy of the soft tissues is notable and the extreme emaciation is accelerated by the inability to take other than liquid food, and the presence often of coexisting tuberculosis. Consciousness is not wholly lost, but the manifestations of intelligence are few. Attention cannot be held and relatives are unrecognized. No heed is paid to the environment. The external language is lost and the evidences of internal language are meagre. The jerky motions continue to the last; exhaustion is profound and a number of hours before death the temperature is sub-normal and the body cold and clammy.

Cause of Death.—The immediate cause of death is usually a pathological lung condition, as hypostatic congestion, edema, or broncho-pneumonia.

The course and termination is the same in the hereditary and so-called senile types—progressive and without remission. There is no evident difference in the symptoms.

Duration.—The duration of the disease in the eight cases averaged 12 years, the minimum being four and one-half years and the maximum 21 years.

Diagnosis.—Chronic progressive chorea must be differentiated from Sydenham's chorea by the age, the frequent incidence of rheumatism, the absence of choreic heredity and the therapeutic test with arsenic. It must also be differentiated from multiple tics and from dementia præcox with mannerisms.

Treatment.—Medical treatment is as yet unavailing. A number refuse all medication, asserting that there is nothing wrong, but on account of the homicidal and suicidal tendencies, the patient's activities must be restricted for the protection of others and himself, and he should be placed in the most favorable environment, removed from all sources of irritation and in the care of patient nurses and attendants accustomed to the care of the insane.

Treatment is symptomatic and is tonic or sedative. On account of the anemia often present, combinations of arsenic and iron are useful as well as the hypophosphites. During the disturbed periods the hypnotics, as veronal, trional, bromides and chloral are used, as also hyoscin hypodermically. Hydrotherapy, hot cabinet, Sitz bath, needle and spray douches have been used, but without noticeable improvement. Positive and negative electricity have both failed.

Precautions must be taken to prevent falls down flights of stairs, as in epileptics. The insertion of sutures will require the assistance of several attendants to hold the head or limbs steady enough to get the suture near where it was intended it should be. Extra and special diet must be given, as usually the appetite is ravenous. Forced feeding through the nose with a stomach tube has rarely been necessary.

PATHOLOGICAL FINDINGS IN EIGHT CASES OF CHRONIC CHOREA.

The cranium in two cases showed the diploe dense and the sutures visible in both tables, less so in the internal than in the outer table. The dura mater in one instance was slightly adherent, in another instance adherent, in four instances not adherent to the skull cap. In two cases there was present over almost its whole cerebral portion, internal hemorrhagic pachymeningitis. In one instance early inflammation of the inner surface over the greater part of the brain convexity was noted. The dura was normal in five cases.

The pia mater in one instance was not cloudy; in a second it was thickened and edematous, but stripped readily from the cortex; in a third the pial vessels were engorged over the whole convexity; in the fourth, there was opacity over the superior and frontal regions with adhesions between the frontal lobes, the membrane edematous and the veins engorged. In another instance it was attached to the dura more firmly than normal. The pia on the vermis of the cerebellum contained bony plates in one case.

The cerebrospinal fluid was noted as abundant in one instance, markedly increased or considerably increased in six instances, two of the latter amounting to hydrocephalus externus.

The ventricles in one case were markedly dilated and extended almost to the occipital cortex; the ependyma was raised in ridges

and irregular vesicles. In one instance the ependyma was granular and the choroid plexus cystic.

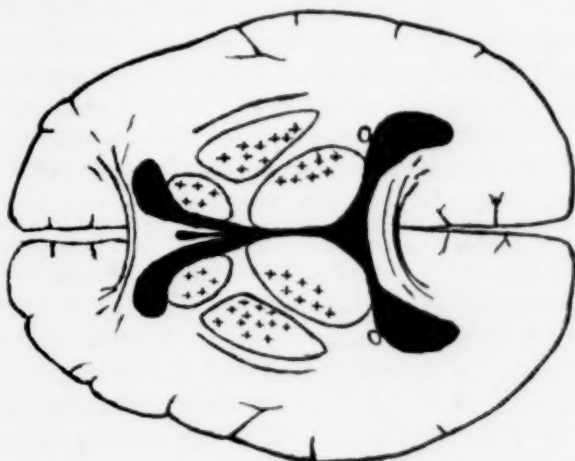
The brain weights including cerebellum, pons and medulla averaged 1168 grams, the smallest being 970 grams in a female and the largest 1360 grams. All cases showed atrophy of the frontal lobes to a marked extent. This atrophy extended in a number of instances to the parietal lobes over the convexity. The consistence of the brain was soft, except in one instance the convolutions over the whole convexity were distinctly indurated. The cerebral cortex was slightly darker and thinner than normal, especially that of the frontal lobes. In one instance there were found small patches about one-half centimeter in diameter of yellowish softening on the outer surface of the first frontal convolutions both sides.

A microscopic examination of the motor cortex shows the presence of large neuroglia cells, which resemble nerve cells. They are especially abundant in the third and fourth layers and are probably those cells which Kölpin described as ganglion cells and attributed to an infantile type of cortex. In this case many ameboid-glia cells are everywhere in the brain, brain stem and spinal cord—as many in the gray as in the white matter.

In another case the ganglion cells of the cortex and especially of the insula show marked sclerosis and pyknosis.

Pathological changes were frequently present in the caudate and lenticular nucleus and in the thalamus. The caudate and lenticular nuclei in a case of seven years' duration were atrophied and yellowish in color. In another instance the basal ganglia were small and of yellowish tint, in a case which had lasted 10 years. In another the basal ganglia presented a mottled appearance to the naked eye, due to irregularity of the blood supply. In a case of seven and a half years' duration the thalamus and lenticular nucleus were slightly paler than normal, many ganglion cells in the thalamus were much degenerated—fatty degeneration being quite abundant. The neurofibrils of the ganglion cells were very well preserved except in the center of the cells, where neurofibrillar degeneration was present. The globus pallidus was darker in color than usual, very similar to the color of the putamen. In the sections of formol fixed material there were found in the thalamus and lenticular nucleus small gray patches adjacent to the internal capsule. These microscopically seemed to be produced by large

accumulations of neuroglia nuclei. In these patches the myelin of the medullated fibers was degenerated. In a vessel in the thalamus large numbers of lymphocytes and some plasma-like cells were present. The vessels appeared proliferated and the nerve cells much disintegrated in the thalamus and lenticular nucleus. Many ameboid-glia cells were found in the thalamus.



CHOREIC LESIONS IN THE BASAL GANGLIA ++.



LOCATION OF CHOREIC CEREBRAL ATROPHY ++.

The usual findings of other investigators include cellular degenerations in the cortex, basal ganglia and spinal cord, diminution in the number of ganglion cells with atrophic changes, shrinking, granular or fatty degeneration and pigmentary changes—nerve chromatolysis being found. Aplasia or familial insufficiency of a cortical layer resulting in a thin cortex has been mentioned.

The perivascular spaces are usually dilated and contained in these lymphatic spaces many Körnchen cells and much protagon. The vessels usually show no sclerosis.

The proliferation of neuroglia and increase of neuroglia cells in the cortex have been mentioned by Lannois-Paviot-Mouisset.

The most modern histopathological studies on chorea, as those by Kölpin, Jelgersma, Alzheimer and others, show the most marked changes in the basal ganglia, especially in the lenticular and caudate nuclei. The lesions consist principally in large accumulations of neuroglia cells, fiber degenerations and considerable cell destruction. The quantity of products of disintegration in the basal ganglia is augmented as a result of the parenchymatous changes.

THE RELATION OF CHOREA TO OTHER NERVOUS AND MENTAL DISEASES.

In its symptoms it closely resembles the infantile cerebral palsies on account of the choreiform motions present.

As might have been expected from the lesions found in the basal ganglia, chorea has a number of points common to it and progressive lenticular degeneration, as described by Dr. S. A. K. Wilson, in the 1912 edition of "Brain." Progressive lenticular degeneration, however, has its onset in young persons, chorea in the adult. The motions present in lenticular degenerations are tremor at the rate of 240 to 480 per minute, while the motions in chorea are gross and jerky at the rate of 80 per minute. Dysarthria and dysphagia are not as notable in the early stage of chorea as in lenticular progressive degeneration. Spasticity of the muscles is present in both. Mental symptoms are present, but in chorea the involuntary spasmodic laughing and crying is not manifested, nor is there fever or contractures, as in lenticular degenerations. The deep reflexes are over-active in chorea and active in progressive lenticular degeneration. The course is slow in chorea and rapid in progressive degeneration of the lenticular nucleus.

NOTE.—I am indebted to Dr. Gonzalo Lafora, Histopathologist at the Government Hospital for the Insane, for his preliminary report on the histopathological findings of two cases given above.

Observation of cases of chronic chorea among other cases of mental disease, lead me to believe that it is distinctly different in its symptomatology from the other nosological entities. To enumerate:

It is easily differentiated from idiocy, imbecility and feeble-mindedness by the more pronounced symptoms of mental defect present in these conditions, as well as the earlier onset.

There is no relation to hysteria or the psycho-neuroses.

Its symptoms in the mental sphere have little relation to dementia præcox. It may, however, be mistaken for the latter when many and varied mannerisms are present. Chorea is much less common than dementia præcox, its percentage in the various forms of permanent insanity being about 0.14 per cent.

The mental symptoms could not be mistaken for paranoia, manic-depressive insanity, involutional depression, toxic psychoses nor paresis, as these conditions are understood to-day, although formerly it was supposed that chorea terminated in general paralysis.

No relation to alcohol or syphilis is indicated. Relation to an exhaustion psychosis is not evident, as the mental symptoms began first in some cases before the muscular symptoms. The exhaustion features are not manifested until near the end.

There is some resemblance to central neuritis in the diarrhoea, jerking and emaciation, but without the hyperaesthesia and rapid course.

There is nothing characteristic in common with the senile psychoses, even in those cases of chorea which become manifest late in life.

In its symptoms there is little, if any, relation to those due to trauma with the exception of such conditions as the infantile cerebral palsies.

Some relation to epilepsy is more evident in the persistent motor discharges and the presence of convulsions of an epileptic type in five of the cases. The motor discharges of chorea occur during consciousness, while in epilepsy the patient is unconscious. Then again, as in epilepsy, there is the ready irritability, sudden assaults, misinterpretations and the occurrence of transitory persecutory ideas.

The relation to diffuse nervous diseases, as multiple scleroses, is not especially marked, although in both the motions become exaggerated when attention is voluntarily directed to them.

In cerebral arteriosclerosis with focal lesion in the basal ganglia, we find symptoms in common with chorea, such as the choreiform

or choreo-athetoid motions present. Again the speech impairment (of the anarthric type chiefly) suggests to our minds Pierre Marie's views of such disturbances in lesions of the lenticular zone, and also Mingazzini's "partial paralysis and irritative symptoms" is suggested.

The absence of other nervous affections or other forms of insanity would indicate a special form of nervous degeneration. Further study on the pulse and respiratory rate, which do not appear markedly increased, is needed. Also on lack of fatigue—this may be analogous to the condition in well trained athletes and may be explainable in that manner and thirdly, on sleep. If, as has been recently advanced, sleep depends on complete muscular relaxation, it should be very light or deficient in conditions where the muscular system is highly irritable or where tonus is increased.

Is the condition cerebral, partly cerebral, or a lower neuron affection? The clinical symptoms of atrophy, emaciation and jerking would suggest the latter, but the absence of electrical changes controverts it. On the other hand, the peculiar mental state, the great preponderance of cerebral symptoms, which is chiefly in relation with cerebral abnormality, the presence of motions during the conscious state and their cessation during sleep, as well as the inability to repress them, their purposelessness and the fact that the movements are of joints as well as jerking rather than fibrillation (present in lower neuron affections), would indicate a cerebral basis. Further evidence that the disease is cerebral is the spasticity—usually an upper neuron symptom. The general muscular atrophy and emaciation are of the cerebral type—slow, general, without fibrillations. Failure to find lesions in the cerebellum in a condition such as this, where incoordination is the most prominent symptom, should direct our attention to the fact that incoordination is often prominent as a symptom in non-cerebellar diseases. The character of the movement defect (incoordination in the adjustment of voluntary motion) is cerebral rather than the weakness or atrophic paralysis of spinal conditions, and no cerebellar lesions are present to account for the symptoms. This should prevent the mistake sometimes made in ascribing such motions to cerebellar dysgenesis. Again, it has been urged that stimuli entering the cord are the cause of such motions and section of the posterior nerve roots has been tried as a remedy, but the widespread motions would

indicate the severing of all such nerve roots if such an operation was effective (which it is not) on account of the diffuse process. The effect of section is not enough to warrant such an operation.

It would seem as though the lesions should be mostly subcortical, between the psyche and the motorium, not under the control of the will, and lenticular nucleus lesions can account for many of the symptoms directly, and also through indirect effect on the motor tracts nearby.

Correlation of the defect symptoms with the postmortem findings would further elucidate the functions of the basal ganglia and the affected cortical layers in neurological and mental terms. Discussion as to the part first affected, as well as to whether mental or physical symptoms were first observed, may serve to further localize function in the basal ganglia.

In chorea, as in all the dementias, some frontal atrophy is to be expected and it is probable that the mental defects are ascribable chiefly to the cortical involvement in the frontal lobes, while the sensory defects and to some extent the evident motor symptoms, can be ascribed to the lesions in the basal ganglia and subthalamic regions.

The motions are to be considered as paralytic phenomena manifested when the cerebral cells are occupied in the mental functions, and shows the intensified effect when the cerebral cortical activity (consciousness) is directed elsewhere than to inhibition of the motions, and thus allowing or permitting them, when there is manifested a constant involuntary and purposeless discharge of energy, resulting in muscular contractions.

It seems probable that in the absence of the usual cerebral cortical inhibition, the impulses spread beyond their usual limits to the motor cells and result in the diversified choreic motions.

These motions appear to be the result of intra-cerebral irritation, originating in the regions where the pathologic process is most marked, and passing to the impaired cells of the affected third and fourth cortical layers, where inhibition of motion would normally ensue, were not the function of these cell layers impaired.

Choreo-athetoid movements have long been recognized as associated with lesions in the basal ganglia, but in chorea we have in addition the presence of these motions only during consciousness,

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Choreo-athetoid movements have long been recognized as associated with lesions in the basal ganglia, but in chorea we have in addition the presence of these motions only during consciousness,

and it, therefore, seems reasonable to ascribe them partly to cortical cerebral influence.

It would be inadequate to classify chorea as a motor neurosis because some of its prominent symptoms were evidently motor. There is also to be considered as of equal importance the sensory symptoms and psychic alteration elicited by examination.

The supposition that the basal ganglia takes part in general automatic movements, as in grimacing and other motor expressions present in chorea, is supported by the presence of the lesions in this disease.

The rate of involuntary movements will probably help to localize cerebral lesions.

Sensory symptoms, as the absence of pain, such as occurs in the thalamic syndrome, is noticeably absent and the absence of symptoms of impaired function of the urinary bladder and rectal trouble until near the end, is different to that expected in lesions of the basal ganglia.

The occasional disturbances noted in the sensory symptoms should lead us to expect thalamic involvement.

The presence of sensory defects, as well as motor, although overlooked in descriptions of this disease, is to be expected from the widespread lesions in the central nervous system. The subjective sensation of cold is frequently associated with frontal atrophy, as in seniles and frontal tumor.

CONCLUSION.

We find then in chronic progressive chorea a varied ancestry, usually of a neurotic type, which shows that the disease has been present and was known in different countries (as for instance the German family shown on the chart) long before Huntington's description of the disease.

A careful examination of the personal histories reveals no disease of infantile or adult life to which the condition is ascribable. More accurate history of the ancestry and progeny of choreics is needed. The ratio of choreics to admissions to this hospital is 1 to 696.

Physical symptoms were most prominent, including convulsions in five cases. The sense of smell was more impaired than that of taste. Ocular movements of choreic nature occur. Many facial

Number	Maternal Ancestry	Paternal Ancestry	Nativity	Color	Heredity	Other possible etiology	Civil State	Sex	Age Onset	Occupation	Suicidal	Homicidal	Duration in living	Duration in those dead
5044	Germany ..	Germany ..	Ohio	White	...	...	M.	M.	41	Ex-Soldier ..	—	—	...	7
5953	...	...	Penna.	White	...	...	M.	M.	26	Ex-Soldier ..	—	—	...	21
6623	...	...	New York ..	White	...	...	S.	M.	45	Ex-Soldier ..	—	+	...	13½
9077	...	...	Indiana ..	White	...	...	W.	M.	52	Ex-Soldier ..	—	+	...	10
10982	Scotland ..	Scotland ..	Scotland ..	White	...	Alcohol ..	M.	M.	40	Laborer ..	—	+	...	11
										Convict ..	—	—		
11241	Ireland ..	Ireland ..	New York ..	White	+	Head trauma.	M.	M.	39	Mail Clerk ..	—	+	...	20
11561	Germany ..	Germany ..	Virginia ..	White	+	Domestic trouble	M.	F.	43	Housewife ..	—	—	...	4½
12004	U. S.	U. S.	Ohio	White	...	Father alcoholic	S.	M.	28	Private ..	—	—	12	...
12211	Germany ..	Germany ..	Penna.	White	+	...	S.	F.	33	Marine ..	+	—	16	...
13925	U. S.	U. S.	U. S.	White	++	Influenza ..	S.	F.	43	Seamstress ..	—	—	...	10½
15313	Germany ..	Germany ..	D. C.	White	...	Alcohol ..	S.	M.	40	Painter	—	—	...	7½
16907	U. S.	U. S.	Ohio	White	...	Trauma	M.	M.	65	Farmer and Ex-Soldier.	+	+	7	...
18077	England ..	England ..	England ..	White	...	...	M.	M.	26	Cornetist, ...	—	—	7	...
18607	France ..	Scotland ..	Ohio	White	++	Trauma	S.	M.	30	Printer, Ex-Soldier	—	—	...	12
18730	Germany ..	Germany ..	U. S.	White	+	...	S.	F.	44	Dressmaker ..	—	violent	8	...
19350	Germany ..	Germany ..	Ohio	White	...	Sunstroke. ...	S.	M.	40	Laborer, Ex-Soldier	—	+	4	...
19564	Holland. ...	Germany ..	Ohio	White	...	...	M.	M.	67	Ex-Soldier ..	—	+	1	...
19801	England. ...	England. ...	Ohio	White	+	...	M.	M.	60	Farmer, Ex-Soldier	—	+	6	...
19882	Ireland ..	Ireland. ...	New York ..	White	+	Feeble-minded	S.	F.	45	Soldier Domestic.	—	—	10	...

contortions were present. The choreic motions approximate 80 per minute. There was slight impairment of hearing and in a number cutaneous sensibility was impaired. Bulimia was a very marked symptom not previously given sufficient notice. The presence of tuberculosis was frequent. The onset of the disease is at about five-eighths of the age at which the disease manifested itself in the parents. Mental symptoms were noted at the onset oftener than physical symptoms, and homicidal tendencies were more pronounced than suicidal. The emotional conditions were chiefly irritability and indifference, varying to depression. In the stream of thought, food occupied the most prominent place. Only little hallucinosis was manifested and delusions of a vague persecutory type occurred but were poorly upheld. There was some attention, retention and memory impairment as well as impaired judgment and partial disorientation for time, place and persons. Impairment of the intelligence also occurred. There was more or less characteristic defect progressing toward dementia in practically all of the mental functions, leading to the conclusion that chronic progressive chorea has definite characteristic mental states with characteristic behavior, course and termination, while on pathologic examination there is found fairly definite pathology with widespread brain lesions, marked in the third and fourth layers of the cerebral cortex and more definitely marked in the basal ganglia and subthalamic regions.

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PRECIPITATING MENTAL CAUSES IN DEMENTIA PRÆCOX.*

By DR. AUGUST HOCH.

We have learned to regard manic-depressive insanity and dementia præcox as essentially constitutional disorders, *i. e.*, as due to an inherited defective anlage. We are, however, at present, not at all in a position to state in what sort of organic deficiency this anlage consists. In dementia præcox there is, to be sure, accumulating evidence of developmental defects in the brain, but what bearing these may have on the production of the disorder is by no means clear. It is also frequently stated that perhaps abnormal functions of internal glands are responsible for this disorder. For a theory that some abnormality of internal secretion may have something to do with the abnormal mental reactions, certain facts might indeed be adduced, but they can as yet hardly be regarded as anything more than suggestive for the problem in hand.

On the other hand, we do know that, so far as the manifest functions are concerned, *i. e.*, the mental side, we find in manic-depressive insanity and in dementia præcox more or less often definite abnormalities of reaction throughout life, in which this defective anlage shows itself *functionally*. I do not know how we could better formulate these personal peculiarities which exist in individuals who break down than by saying that they show some defect of adaptation. As a matter of fact we are learning to describe, to a certain extent, what goes on in dementia præcox in mental terms, because we can follow somewhat the steps of the deviation from the normal adaptation, and can see in the special forms of reaction in what way the adaptation fails. Above all, we are learning how various situations in life, *i. e.*, causes which can best be described in mental terms play an important rôle in these disorders, just as they do in the neuroses.

When I desire to speak to-day briefly of such precipitating causes in dementia præcox and dementia præcox-like reactions, I wish to be clearly understood that these causes are regarded as

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nothing more than what the term implies, *i. e.*, precipitating factors, and that, moreover, they represent only the purely mental side of these precipitating factors. But even then they seem to me to deserve a good deal of attention, as through them we become better acquainted with the forces at work, the processes which go on in a mental breakdown, than has hitherto been possible by any other avenue. Because such a study of precipitating factors also aims at a better understanding of the meaning of reactions, it seems to me to be a very important field of psychiatric research.

It is often pointed out, especially in the case of dementia præcox, that the individual showed certain abnormalities before the precipitating causes were at work, and it is therefore claimed that the latter could not be of much importance. In a well-known text book for example while mention is made of certain "so-called" mental causes in dementia præcox, it is at the same time claimed that these are more likely symptomatic than really causative. If by this is meant that some internal factors are as much at fault as the external cause, we agree of course. But if we keep in mind what I have just said, it is obvious that, for the purpose in hand, any factor which we can show to be related at any time in the life of the individual with an increase of symptoms, or which leads to a greater failure of adaptation, must be regarded in the light of a precipitating cause, and must be looked upon as worthy of an attempt to understand it. What has stood in our way of recognizing these precipitating mental causes has been the fact that we regarded them too much from our normal point of view. We can understand, to a certain extent, the fact that a bereavement should cause a melancholia, because a bereavement is known to produce depression normally, although even this is really not an explanation. But we know that all our acts, mental attitudes and reactions, have a life history, a development; and psychoanalysis is teaching us to understand this development, and it is teaching us that there are factors of which we are not aware, yet which have a tremendous dynamic value in shaping our reactions. With these principles in mind we are better qualified to study the actual significance of precipitating causes which on the surface would seem utterly inadequate to produce the effect which they seem to produce, and we are learning to recognize in relatively trivial experiences factors of the greatest importance, and

have means to understand the reasons why specific factors meant so much to a special individual.

This has been clearly shown in the neuroses, but *we* are particularly interested in psychoses and we find that similar conditions exist in them, if we are willing and have learned to pay attention to them. We are not often able to make an extensive analysis in psychoses, but we can show not infrequently why certain situations represent the starting point of a breakdown. This, in other words, the existence and the meaning of precipitating causes which on the surface seem inadequate to explain the result—which, however, can be understood by further analysis or on psychoanalytic principles—I should like to show you briefly in a few simple examples of dementia præcox, or at any rate, dementia præcox-like reactions.

I shall first mention a case in which a cause was found which all of you have repeatedly seen as the starting point of a psychosis, namely, a sexual assault. But certain points in the case brought out by a more careful study also throw some light on the reason why such a cause should have produced the breakdown. The facts of the case are these: One night a man who had paid attention to the patient for some time made advances of a grosser sort. Almost immediately the patient developed her psychosis. She felt "a crack" in her head, "did not know" herself, people about her "seemed different." This was what we not rarely find as a rather characteristic beginning of a typical dementia præcox breakdown. We might say she must have been abnormal before. This is, of course, true, but we cannot deny the dynamic force of the cause, and we must therefore ask, why should the result have followed? Her history is interesting in this connection. We find that a slight change came over her at puberty, she became languid, rather hard to get along with, rather nervous, afraid to be alone. She also became more bashful, not inclined to have much to do with the other sex. She had, at times, crying spells for which neither she nor those about her could give any explanation. Another change came over her when the man above mentioned *began* to pay her attention. She became more difficult to get along with. Although she continued to receive the man's attention, she showed in other ways that an opposing force was also at work. She began to think, contrary to facts, that the other girls wished to take the

man away from her, that her cousin was telling him stories against her. But she worked during this time, and so far as we can learn, without difficulty. This went on for two years before the final breakdown occurred. The patient showed, therefore, three phases in the development of her psychosis: The first came at puberty, the second, at the time when the man began to pay attention to her, and the third, when the attention of the man became gross. We cannot very well escape the conclusion that the changes, which consisted in successive steps of a shutting-in process, occurred every time that a sexual adaptation was required of her. It is hardly necessary to point out that puberty, with its awakening of adult sexuality, and the first love affair represent such situations. That later it was not merely the gross assault which one might look upon from a superficial point of view as a mental shock, but a general incapacity for adaptation to sexual demands is evident from the history—and it is moreover shown in the next case of which we shall presently speak. Such a marked shrinking from sexuality is perhaps not easily understood from the normal point of view, but aside from the fact that similar principles have frequently been pointed out by Freud in the case of the neuroses, let any one look through careful anamneses of marked dementia præcox cases to see how pronounced this shrinking often is. Now the psychosis itself is also interesting. The content was very sexual. She felt that sexual sensations were produced in her, men talked to her, said "fierce things," etc. Her mind was therefore taken up entirely with sexual fancies. On the one hand, therefore, evidence of being unable to adapt herself to sexuality in reality; on the other hand, evidence that when this adaptation fails entirely, then her mind is dominated by sexual experiences in fancy. It seems, therefore, not too far-fetched to formulate the situation in some such manner as this: It seems that she shrank from having any outlet to her instinctive demands in reality, and finally, under stress, expended these forces in fancies, while then at the same time her contact with the outside world became markedly interfered with. This is a partial dynamic formulation of a case in which the ordinary clinical formulation merely speaks of an acute outbreak of dementia præcox.

The second case is similar, and indeed I could quote others of this rather characteristic situation. She is a young woman of

22, who became somewhat more unsociable at 17. (We were unable to find a cause for this.) Seven months before admission she made the acquaintance of a man. It is stated that she became at once very much infatuated with him, and got engaged after a short time, in other words, a rather precipitate affair. That there was something wrong about this is shown by what followed. She soon became abnormal, was afraid, had the idea that her fiancé would come after her with a knife, had crying spells, wanted to die. In spite of this she was encouraged to marry and of course very soon after became much worse and showed symptoms which are quite comprehensible from our view of the case, as they show us, like the earlier symptoms, her antagonism against the union or her lack of adaptation toward the sexual demands. She refused to go to bed at night, was afraid of her husband, was not sure whether it was her husband, and soon she got into a somewhat perplexed negativistic state. You will observe that here the situation was very similar to that of Case I, but without any shock of the more comprehensible sort, *i. e.*, comprehensible to our normal thinking, but clear from the point of view given above.

The next two cases show a somewhat different principle of precipitating causes, which we shall discuss after the facts of the cases have been given.

Case III is a woman whose psychosis, we are told, came on without cause. By inquiry it was then discovered that there existed, at any rate, a definite occurrence which immediately preceded the onset of the mental breakdown. The patient told us that a woman came to her saying that she had something to tell her. The patient refused to listen but at once began to worry a great deal, ostensibly because she had not listened to this woman. This apparent cause seemed to be quite an inadequate reason for the depression. The patient was, therefore, told to say something about the woman, and it finally came out that she was a person whose husband had deserted her. The patient's further associations led to the idea that perhaps her husband might be desirous of leaving her in the same way. (In all probability this thought was by no means clearly conscious at the time.) At this point the cause became somewhat clearer, but it was still necessary to

understand the setting of this cause. In this connection we found the following:

The patient, who is a woman of 38, is said to have been inclined to worry all her life, to brood over difficulties, and to be somewhat shy. She married four years before admission. That the adaptation to her husband was not perfect is seen in the fact that ever since marriage she showed certain mental or neurotic symptoms. On the one hand, she was decidedly jealous of him and suspected him of infidelity; on the other hand, she was always afraid some accident might happen to him. This latter trait was quite prominent and she was apt to picture to herself with anxiety what might befall him. We have considerable evidence that both of these symptoms are elaborations of the same theme, namely, that both represent wishes for freedom from the husband; the first representing this desire with a positive assertion of her own desire for other men, which is then projected to the husband; the other, the anxiety, a hidden wish that something may happen to him. We see, therefore, that the woman had for several years the desire in some way to get free from the husband. This desire, of course, was unconscious. Consciously we see it compensated in various ways owing to her moral opposing forces exerted by the main tendencies of her personality, and emphasized by the fact that she is a devout Catholic and, as she repeatedly stated, impressed with the fact that the church does not permit the dissolution of marriages. We now begin to see why the woman's apparently trivial statement had such an effect. The situation created by the woman was well qualified to rouse her most important subconscious wishes. The rousing of her subconscious wishes (without their becoming conscious necessarily) was first responded to with certain protective mechanisms, namely, anxiety and depression then with more marked symptoms of a dementia præcox-like reaction. We see such a sequence of more benign and more serious reactions not infrequently in dementia præcox. Here then the precipitating cause was at first not even mentioned, and when we found it, it seemed to have no meaning, whereas in its setting the significance became clear and the assumption that it really had something to do with her breakdown, much more probable.

Finally, I desire to present briefly a fourth case, which is somewhat more complicated. The patient is a young woman who has presented for several years a very slight condition which seems to be essentially one of mild dementia præcox, but in which she has had several sharper, more transient, psychoses. At first the general disorder came on after she had broken off a love affair. We cannot enter upon the significance of this now; what I desire to dwell upon particularly is one of the short psychoses which followed immediately upon the reading of a story. It seemed to be an interesting problem to see in what way this could possibly bring about the sharp attack of mental disorder. We were all the more inclined to take the patient's word for the statement that she became abnormal immediately after reading this story, and thus to look upon the latter as the precipitating cause, because she said that nothing she ever read gripped her like this particular story.

In order to understand the connection between the cause and the psychosis, it is best to describe the latter first, because it was through the analysis of the symptom picture that the understanding of the meaning of the cause came to us. The psychosis, which, by the way, was not associated with any clouding of consciousness, lasted about a week. At first glance, the actions and the productions of the patient during the period were quite incomprehensible. The condition was, however, carefully described and later analyzed as a dream is analyzed. The main parts of the trend were taken and the patient's associations were noted. They led to, essentially, two topics—the dead father, on the one hand, sexuality, death, and having children, on the other hand. Without going into details I shall simply state that it was then found that the leading trend in the unconscious which manifested itself in and determined the symptoms of the psychosis, was what we may roughly formulate as an idea of having children with her father. This was further corroborated by a study of the content of other former brief upsets in which the same meaning was again found, indeed in them this meaning was even less veiled than in the recent attack. In one of them she heard the voice of her dead father calling her, then felt she was dying, but she also thought she was being delivered of a child and that a picture in the room of a woman and a child represented herself;

or again, on another occasion when in a general hospital the physician came in and spoke to her, a physician who reminded her of her father, she called him father and then said "I am dying." From many associations it is clear that death and sexuality are closely related in the mind of the patient, as they are indeed not infrequently in many others which I had an opportunity to study. At a later visit with the same physician, she saw her father, as she puts it, in or behind the doctor, then a vision of a female figure which had some characteristics of herself, and on the other side, many small spheres. To the latter she associated eggs and also children. In several upsets then, this same trend recurred in various guises, so that we cannot doubt its real significance, namely, that of having children with her father. This too brief sketch, as I said, was necessary to understand the reason why the story could act as a precipitating cause.

The story, which by the way was miserable, from a literary standpoint, and which for this reason was all the more unlikely to impress a girl of very fair artistic taste, had it not been for some special reason—represented a phantastic scene in the wilderness of Canada, where three people lived together far away from civilization—an older man, an older woman, and a young girl. The man was called a mystic; he had occult powers over every one, even the animals of the region. He was a fanatic, who called himself Adam because he wished to be the father of a new, perfect race. A similar idea, namely, to be the source of a new, more perfect race, had appeared, before the story was read, in the patient's dreams and fancies. Adam had a child with the older woman, but finding that the child had a blemish he makes up his mind to abandon the older woman, to sacrifice the child, and to marry the young girl so as to accomplish with her the desired end. The marriage is about to take place, mystic, symbolic ceremonies are gone through. The young girl, whom the patient clearly (though not consciously) identified with herself, just as she identified the old man with her father and the older woman with her mother, feels a demonic attraction to this older man, and only escapes finally by being rescued through the interference of a young hunter who had entered the precincts.

This was then the story which gripped her so and which was immediately followed by the delirium above described. I think even with the fragments of the analysis which I have given, it is clear why this should have been so. It represented her own unconscious conflict, her own unconscious demonic attraction to her father. A word should perhaps be added about this so-called incest complex, or for the man the Oedipus, for the woman the Electra complex. The idea of a sexual attraction to the parents is something so revolting and so absurd to the normal mind that it is at first difficult to accept that it should be of such widespread importance as it plainly is. But we must remember that we are, in this, dealing with an infantile attachment from which the individual has not been capable of freeing herself in a normal way, or to which she has again regressed, and that love, with the attributes which belong to it, is more or less centered upon the father imago. Otto Rank has given us a valuable work recently in which he furnishes a wealth of material demonstrating the importance of the "Inzest Motiv" in poetry and myth; and we as psychiatrists, who have daily access to the study of dementia præcox, where this complex is often so apparent and so plain that we cannot help seeing it, we must above all others see its importance in determining symptoms, and its dynamic force.

We have, then, in the last two cases another principle. The precipitating cause roused certain subconscious wishes by bringing from the outside a certain set of ideas which were in harmony with these subconscious wishes. However, it is probably an important principle for this type of precipitating cause, that the situation brought from the outside be sufficiently veiled so that the conscious personality cannot deal with it. What seems to follow then is either a liberation of protective mechanisms, such as perplexity, anxiety or depression or essentially an overpowering of the conscious personality by the subconscious wishes.

It has recently been pointed out that we can speak of psychogenic psychoses only when the content of the precipitating cause is also found in the content of the psychosis, and that this is a relatively rare occurrence. From the cases here presented it seems clear that such a relationship of cause and psychosis must be much more frequent than the view based on the merely superficial aspect of cause and psychosis would lead us to believe.

In this brief discussion I had to limit myself to a short account of a few cases in which we have tried to understand somewhat what takes place. It might be said that the formulations given are perhaps one-sided, and it must be frankly admitted that in our present state of knowledge we have to look upon all such formulations as tentative. But I do not think that we should therefore shrink from attempting to form some opinion as a working hypothesis for our investigations. It seems to me that we have been able to find out two types of precipitating causes: First, those which represent plain sexual demands which the patient cannot meet; and secondly, those which stir strong subconscious wishes. There are, of course, other types of causes. And I hope also to have shown to you that a study of precipitating causes from the point of view of psychoanalytic principles is an important field of psychiatric investigation which, as I have said, helps us to get a better insight into the forces at work than we can at present gain from any other avenue of approach. We have dealt entirely with dementia præcox, but our experience at the Psychiatric Institute has convinced me that such a study is also of value and destined to reveal important facts when applied to the investigation of the manic-depressive psychoses.

DISCUSSION.

DR. WM. A. WHITE.—I was greatly delighted to hear Dr. Hoch's paper. It is always illuminating to hear the interpretation of psychoses rather than simple descriptions. We have already gone beyond the point of merely dissecting things, and we are now looking for reasons. I am reminded of a patient I saw day before yesterday. He came to me and told me that he had had an attack in a theatre when he was viewing a moving picture show, and he described the attack in this way: He said he had a feeling as if he was becoming paralyzed in his arms and legs. The film showed the rescue of an adopted child by a fireman, and a second film was a Wild West scene; a young man who had been refused marriage by his sweetheart, had run away and joined a tribe of Indians.

The man had been married four years and had had no children, which fact bothered him a great deal; he had consulted a physician and his wife had consulted a physician several times and had finally undergone a slight operation. The seeing of this moving picture show came on the anniversary of his wife's operation. His attack was like an attack he had seen some years before, and about which he had come to the conclusion that it was due to some sexual indiscretion. At the age of 15 he had resorted to masturbation, and he had fully decided in his own mind that

his lack of children was due to these sexual indiscretions. So you see these films brought the events of more than fifteen years past and his indulgence in masturbation came immediately after his father's second marriage to a woman he described as being nearer his age than his father's age, and it is fair to presume that he had something verging on love for his foster-mother. He had a feeling in connection with his neurosis that he was about to become insane. When he saw in the film of the Wild West show the going back to primitive conditions it corresponded to his desire to throw off the conventions of society, and so the films become the precipitating factor in a very complex situation, and they have only produced a psychosis, I think, by suggesting a wish fulfillment. Now when the unconscious and the fore-conscious wishes come together then we have the true precipitating factor for a psychosis, and the thing I want to emphasize particularly is that it is absolutely essential to know some part of the psychology of the unconscious before we can reach any true appreciation of the psychology of the interpretation of a psychosis.

The books of fairy tales which you bring your children up on are filled with complex stories and you will find not infrequently the precipitating factors in psychoses come from those very stories which the children are allowed to feed upon.

THE PSYCHONEUROSES FROM THE STANDPOINT OF THE PSYCHIATRIST.*

By EDWARD L. HANES, M. D., ROCHESTER, N. Y.

The influence of peripheral lesions in the genesis of the psychoneuroses has occupied the attention of the medical profession for many years, with much diversity of opinion relative thereto. The intensive study of anatomy and pathology and the worthy effort to establish disease processes upon demonstrable fact in our modern medical schools have developed physicians keenly alive to physical alterations of the body and with a consequent tendency to regard all clinical manifestations of disease as of physical origin. It would be folly, indeed, to question the wisdom of the medical schools in assuming that the pre-requisite to the correct interpretation of clinical symptoms generally, is a sound understanding of anatomic and pathologic facts, together with those of their attendant branches. At the outset, therefore, it must be emphasized that no such questioning thought is here entertained.

The members of this association can all recall a time not long remote when psychiatry was deemed the most backward field of medical knowledge; when, in fact, the general profession looked askance at the scientific attainments of the psychiatrists—and practically solely for the reason that psychopathology was not established on an adequate anatomic basis. It was but to be expected, under such circumstances, to find in the evolution of specialism in medicine based on recognized anatomic changes, that those engaged in such special practice should choose to interpret mental and nervous symptoms for themselves without regard to the psychiatrists and neurologists. Added impetus was given to this tendency through the further fact that many neurologists were but indifferent psychiatrists and were themselves frequently inclined to acquiesce in this theory of peripheral origin of central psychotic symptoms, especially in that comprehensive group of cases falling rather without the usual field of psychiatric activity embraced within the term psychoneuroses.

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

I think that most physicians who deal extensively with the psychoneuroses, and who have had adequate training in psychiatry, are quite inclined toward conservatism in ascribing any large number of these cases to peripheral lesions *per se* in the presence of an essentially normal mentality. While not prepared to deny the possibility of such a genesis, they are certain of its rarity, and hold that only in the presence of a central nervous system predisposed to easy upset by reason of constitutional nervous instability, or as a result of depleting and exhausting bodily conditions, do we commonly observe peripheral lesions exercising marked influence in the genesis of the psychoneuroses. Were this not the fact it seems inevitable that we should constantly witness the greatest prevalence of nervous and mental disorders of this nature in every surgical condition, which, of course, is not the evidence of experience. They are aware, too, that identical disorders of nervous and mental type which are ascribed by advocates of this theory to lesions of the peripheral nervous system may be, and are just as commonly, duplicated in the absence of any demonstrable or probable peripheral lesion, as the following two cases serve to illustrate most forcibly:

A year ago a young Jewish woman of about 23 years was referred to me by one of our local nose and throat specialists, exhibiting a well-marked psychoneurosis in the nature of a dominating obsession relative to a supposed nasal difficulty. Some months earlier she had consulted a prominent nose and throat specialist of our city, who had diagnosed nasal obstruction of some sort, and who had operated for the relief of one nostril. There then arose some misunderstanding relative to the fee for the work, with the result that the obstruction to the opposite nostril was refused attention. Comparatively soon her distress was such as to take her successively to two other reputable nose men, both of whom performed operations for the relief of the remaining obstruction, and both of whom assured me that every indicated surgical procedure had been undertaken in her behalf. The first operator, however, was manifestly annoyed at certain features of the case and asserted positively that there was probably remaining difficulty which he could remove. The young lady herself, the daughter of an insane mother, was much upset as a result of so much controversy, continued over a period of months, and when

seen by me was completely dominated by her nasal affliction. It was impossible to convince her that there was nothing more to be done in a surgical way to her nose, and she was sure if the first physician could again treat her he would be successful in completing her cure. She wept and bemoaned the fact that no one could help her except the first specialist, was unable to think of anything else or to apply herself to any occupation, and her days were given over entirely to the contemplation of her unhappy condition. I quickly found that I could gain absolutely no control over her, and she was resentful against the thought that there could be any mental complex in her case. The fact that two other excellent nose specialists were positive no further operation was indicated failed to impress her in the slightest degree. Under such circumstances, and fearing that her mental integrity was being undermined, I communicated my opinion of the underlying mental mechanism in the case, to her first physician, with the suggestion that personal differences be waived and his reassurance of the completeness of operative measures in agreement with the other specialists be given her. This he refused to do, taking a distinctly adverse position, asserting that he believed difficulty still existed uncorrected in her nose, and that he was familiar with many cases of this sort originating on the sole basis of nasal trouble, the correction of which had been followed by recovery. At last, under the influence of a rather blunt statement relative to his responsibility for further mental upset, he undertook her further treatment and the patient was lost to my observation for many months. In April, 1913, however, she returned to my office asserting that she had expended \$700—all the money the family had to devote to such purpose—in a vain effort to obtain cure; that she was then under another nose specialist, who maintained that the trouble was now located in the frontal sinuses, and who advised that she go to New York city to consult still another nose specialist. The family now state their belief that there is nothing really the matter with her; the patient tells me confidentially that she feels like destroying herself; that her home relations are unbearable, and that life holds nothing for her. The situation may be better imagined than described.

The last day of January, 1913, a second case came under my observation, in which an obsession was dominating the life of

the patient, and in which the nose was again the source of complaint. The patient was a woman of 33 years, of Irish ancestry and of comely appearance, possessed of an oval face, jet-black hair and eyes, and a nose of pronounced Roman type, giving her a decided impress of Jewish lineage. She felt that her nose was a disgrace; asserted that she looked like a Jew; thought everybody noticed and commented on her appearance; said she became nauseated if she looked in her mirror; her heart would sink and she belched large quantities of gas. She was greatly perturbed, wept in the office; said she was going insane and would rather die than lose her mind; admitted her husband was most kind to her, but insisted that she was such a repugnant person that no one could possibly care for her; her friends must only tolerate her. She could be only partially reassured, and besought the physician piteously to suggest some operative procedure which would change the shape of her nose. The explanation that her nose represented a perfectly normal type and that she was not unattractive gave her only temporary satisfaction. There was absolutely no complaint or suspicion of anything abnormal about her nasal organ.

Here are two cases presenting almost identical mental symptom-complexes, in one the development being ascribed to a peripheral irritative lesion within the nose itself, while in the other no thought of such a method of origin is entertained. Can any competent observer doubt that the real mechanism of development is identical for both cases, and that such mechanism is of purely psychogenetic character in the presence of poor balancing faculties?

It would be unnecessary to comment further on this subject in this assembly of psychiatrists were it not in emphasis of the thought which has seemed to me to justify this presentation at all, viz., that large numbers of our contemporaries in other medical fields of activity do not recognize this psychogenic mechanism in the evolutionary development of the psychoneuroses, and themselves constitute a great menace to the mental integrity of these constitutionally predisposed individuals by reason of their professional attitudes in dealing with such patients.

If we consider again the first case cited above—that of so-called peripheral origin—it is certain that this young woman was at first

sufficiently annoyed by the obstruction within her nasal passages to send her to a nose and throat specialist for relief. In discussing her case freely with her as he did, intimating that there was remediable difficulty present he convinced her at once that her fears were correct and that an operation would be necessary. Now it is impossible to say just exactly what anxieties were kindled within the mind of this nervously organized patient, but whatever they were they were soon accentuated by the problem of meeting a large fee, deemed insufficient later by the doctor, which in turn sent her away from his office with her obstructive difficulty only partially relieved and her mentality increasingly agitated. Under such circumstances, of course, she could not rest, with the result that other specialists were consulted; other operations were performed; discussions and controversy between the several physicians and in the presence of the patient arose, till the nasal appendage became the most vivid and dominant concept of this young lady's consciousness. In the case of the Irish woman it is apparent that the shape of her perfectly healthy nose giving, to her mind, certain obnoxious racial characteristics to her appearance and undoubtedly leading to frequent, not necessarily, ill-intended comment on the part of relatives and friends, formed a sore point in her psychology and gave rise to internal conflict with unhappy ruminations of a self-depreciatory nature which later constituted the basis for her obsession. Whether one accepts the dissociation hypothesis in the mechanism of production of these obsessions is immaterial in this present connection: the fact remains that the genesis in both instances was purely central and psychologic, not peripheral except as the irritation within the nose in the first case and the shape of the organ in the second served to focus the internal mental life of both patients in an unhealthy way.

Within the past few years a considerable number of psychoneurotic cases have come under my observation, and, in an effort to analyze the mechanism of development so far as lay within my capabilities, I have been astonished at the apparent part played therein by the discussions and conflicting opinions of the various physicians who had been successively consulted by these patients. It is the common history of those so afflicted that they pass from one physician's hands to another in a vain search for help. These physicians are untrained in the interpretation of mental phenom-

the patient, and in which the nose was again the source of complaint. The patient was a woman of 33 years, of Irish ancestry and of comely appearance, possessed of an oval face, jet-black hair and eyes, and a nose of pronounced Roman type, giving her a decided impress of Jewish lineage. She felt that her nose was a disgrace; asserted that she looked like a Jew; thought everybody noticed and commented on her appearance; said she became nauseated if she looked in her mirror; her heart would sink and she belched large quantities of gas. She was greatly perturbed, wept in the office; said she was going insane and would rather die than lose her mind; admitted her husband was most kind to her, but insisted that she was such a repugnant person that no one could possibly care for her; her friends must only tolerate her. She could be only partially reassured, and besought the physician piteously to suggest some operative procedure which would change the shape of her nose. The explanation that her nose represented a perfectly normal type and that she was not unattractive gave her only temporary satisfaction. There was absolutely no complaint or suspicion of anything abnormal about her nasal organ.

Here are two cases presenting almost identical mental symptom-complexes, in one the development being ascribed to a peripheral irritative lesion within the nose itself, while in the other no thought of such a method of origin is entertained. Can any competent observer doubt that the real mechanism of development is identical for both cases, and that such mechanism is of purely psychogenetic character in the presence of poor balancing faculties?

It would be unnecessary to comment further on this subject in this assembly of psychiatrists were it not in emphasis of the thought which has seemed to me to justify this presentation at all, viz., that large numbers of our contemporaries in other medical fields of activity do not recognize this psychogenic mechanism in the evolutionary development of the psychoneuroses, and themselves constitute a great menace to the mental integrity of these constitutionally predisposed individuals by reason of their professional attitudes in dealing with such patients.

If we consider again the first case cited above—that of so-called peripheral origin—it is certain that this young woman was at first

sufficiently annoyed by the obstruction within her nasal passages to send her to a nose and throat specialist for relief. In discussing her case freely with her as he did, intimating that there was remediable difficulty present he convinced her at once that her fears were correct and that an operation would be necessary. Now it is impossible to say just exactly what anxieties were kindled within the mind of this nervously organized patient, but whatever they were they were soon accentuated by the problem of meeting a large fee, deemed insufficient later by the doctor, which in turn sent her away from his office with her obstructive difficulty only partially relieved and her mentality increasingly agitated. Under such circumstances, of course, she could not rest, with the result that other specialists were consulted; other operations were performed; discussions and controversy between the several physicians and in the presence of the patient arose, till the nasal appendage became the most vivid and dominant concept of this young lady's consciousness. In the case of the Irish woman it is apparent that the shape of her perfectly healthy nose giving, to her mind, certain obnoxious racial characteristics to her appearance and undoubtedly leading to frequent, not necessarily, ill-intended comment on the part of relatives and friends, formed a sore point in her psychology and gave rise to internal conflict with unhappy ruminations of a self-depreciatory nature which later constituted the basis for her obsession. Whether one accepts the dissociation hypothesis in the mechanism of production of these obsessions is immaterial in this present connection: the fact remains that the genesis in both instances was purely central and psychologic, not peripheral except as the irritation within the nose in the first case and the shape of the organ in the second served to focus the internal mental life of both patients in an unhealthy way.

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ena and, almost without exception have no more knowledge of mental mechanisms so far as they relate to abnormal mental states than the average layman. Under such circumstances it is not surprising that they seek to establish the psychic symptoms on physical bases within the realm of their own special fields of practice. Thus the eye, ear, nose and throat, the stomach and intestines, the cardio-vascular system, and specially the genito-urinary apparatus, are successively indicted as the source of the difficulty, with the result that these patients are greatly agitated and upset; the extent of their trouble is unduly magnified by them, and they are forced inexorably into a state of confirmed psychopathy largely through the indiscretions of their misguided physicians. It was but a few months ago that I was consulted by a hopeless case of this sort, whose astounding recital is a splendid illustration of the point I wish to make. Lest the story seem incredible I will state that the physicians, whom I will designate alphabetically, are all known to me, and their specialties, personal characteristics and methods of treatment are usually so correctly indicated that I have no hesitancy in asserting that in all essential particulars the patient's statements give a distinct impression of trustworthiness.

The woman, aged 35 years, gave no reliable intimation of her ancestry and I have no information relative to her own mental organization aside from her statement that she was temperamentally nervous. A few years before she had passed through a difficult child-birth and shortly afterward, while in a weakened physical state, she was forced to bear an upsetting sorrow in a succession of deaths in her family, including the baby, her mother and her husband. As a result she passed into a condition of what was referred to as "nervous prostration." She consulted Dr. A, who, following examination, removed her to a private hospital and, with Dr. B, operated for the repair of a lacerated cervix. As she did not improve nervously she consulted Dr. C, who stated that the fundus was "too large," so that she underwent a series of local treatments at this physician's hands, which were finally interrupted by reason of a cross-continent trip of the doctor. She then consulted Dr. D, a surgeon, who, following examination, stated that he found the pelvic organs in "terrible condition," and who took her to another private hospital for treatment, which

proved to be in the nature of a complete hysterectomy, undertaken as the patient informs me, "without her knowledge or consent." Subsequently when she began to suspect that something was radically wrong she questioned the surgeon, only to be informed that her condition justified the procedure "and that he was performing so many similar operations as to be entirely certain of his position." She assured him that no other physician had spoken to her of such a necessity; expressed her disapproval, and was told "to go home and stop talking about it and she would be better than she ever had been before in her life." Of course her condition was greatly aggravated when she found herself unsexed, and she was so worried and upset that she soon consulted Dr. E, an excellent surgeon and a conscientious man, who told her that "she had a small tumor in the vaginal wall which ought to be removed at operation." This she refused on the say-so of any one man, in view of her particularly disastrous surgical experiences, so she consulted Dr. F, a woman physician of excellent standing in the community, who asserted that she found no indication of vaginal tumor or for operation. In view of the importance of Dr. E's opinion, however, Dr. F advised her to consult Dr. G, another woman physician of large practice, who stated that she could not substantiate the diagnosis of vaginal tumor, but who asserted that "patient had sciatic neuritis which might lead to a paralytic condition." In a state of greatly accentuated nervous agitation and in great dread of possible paralysis she next consulted Dr. H, a surgeon, who confirmed the opinion of Dr. E, relative to the presence of a small vaginal tumor and the need for operation. But the patient could not bring herself to the point of submitting to operative measures again, so she went to Dr. I, a member of the Spiritualist Church, who treated her for reputed heart disease. This man, whom I know very well, and who is really a physician of the most kindly presence and intentions, ultimately felt that her nervous system required treatment which he could not give, so he explained to her that a layman friend and church fellow was a magnetic healer and had accomplished some remarkable cures in nervous cases similar to her own, and suggested that she place herself under this healer's treatment. This consisted in a peculiar, rapid finger vibratory movement along the spine for the purpose of "keeping the nerves from setting," as

she was assured. This procedure really appeared to produce a marked effect not altogether satisfactory in that while her pain was temporarily dispelled, later it appeared to return with increased intensity, and to involve her head as well as her spine. This healer would not specify any definite time within which she might expect cure, more than say that "it might take two or three years." So when she decided to leave town for a time and asked him to recommend some one to continue his treatment he advised her to take "absent treatment with him." She then decided to take massage from a local masseur, but found it unavailing and consulted Dr. J, a nerve specialist, who "would not tell her very much about her trouble, and who would not confirm the diagnosis of 'sciatic neuritis,' but who treated her for some time for 'stomach trouble.'" Dr. K, a surgeon and general practitioner, next treated her, telling her some strange tale which I do not recall, and at length she fell into the hands of a young general practitioner who had had psychiatric training, and who told her for the first time that her trouble was, in his opinion, of a functional character. I think I may be pardoned when I state that in view of this remarkable narrative I had no courage or desire to add my name to her list and refused to undertake her treatment. I did attempt to review the situation to her and to point out the mechanism back of her trouble, but evidently unconvincingly, for at last accounts she had consulted two other physicians of my acquaintance.

Now such a narrative as this undoubtedly has its humorous side, but when we consider the effect on this unfortunate woman's mind of so many and such diverse opinions of the numerous good, bad and indifferent physicians whom she consulted, not one of whom was qualified to treat her case and not one of whom was aware of his own limitations in this respect, I think you will agree with me that the humor of the situation becomes very grim, indeed, and that really such a case constitutes what might properly be termed a medical tragedy, with the doctors in the rôle of evil spirits.

What shall we say of practice of this sort—is it legitimate practice or is it mal-practice—and is there any possible remedy for such a state of affairs within the ranks of our profession? This case, while extreme, is only one of many which could be brought

to your attention and represents a type with which you are, perhaps, sufficiently familiar to know that it is in no way unique. My own belief is that such practice constitutes a real evil in our profession, but one in which physicians generally have no sense of their own duplicity owing to the deficiencies of their under-graduate training, which teaches them nothing concerning the simplest mental mechanisms. I am not a teacher of psychiatry or of psychopathology and I am aware that it is much easier to criticise than to rectify errors in teaching, but I cannot remain insensible to the fact that these medical men in general and special practice are all graduates of our medical schools, in which psychiatry and neurology are taught. I have been interested recently in several articles by teachers of psychiatry—members of our own association perhaps—outlining the aims and objects of their teaching, and I have no special criticism or commendation for what they have said. I would like to ask, however, just how much practical knowledge of psychiatry any member of this association ever gained as a result of such under-graduate teaching? Did you learn to diagnose any mental state whatsoever as a result of your under-graduate study, or was psychiatry the one thing in all your course about which you thought you knew something but found you knew nothing? In fact, I am prepared to assert that it could not be otherwise, for you all recall what perplexities confronted you during the early years of your asylum practice. Only a few cases appeared clear-cut and simple—the problems of diagnosis; the interpretation of the significance of mental symptoms, and the questions of prognosis were bug-bears not for weeks but for a period of several years. And, furthermore, we know now after all these years of asylum association and study that the wisest among us are often compelled to speak softly in the presence of mental symptoms even to-day. So the problem of how best and what to teach under-graduate students in matters psychiatric can hardly be considered as settled, I am quite sure, and one must needs pause after such recitals as have been presented, with the question, "What can be done about it?" I beg you to believe that I do not deem myself competent more than to discuss the subject, leaving it for wise men to reach conclusions, but considering the present deficiencies of the profession at large concerning all things psychic, and having in mind the shocking

consequences to patients of such deficiencies, it would seem that more time should be spent in our medical schools in attempting to understand something of the simpler mental mechanisms underlying abnormal psychic states. It is not necessary that we should accept completely the Freudian theories in order to appreciate the wonderful stimulus which such tireless, painstaking and exhaustive studies give to our efforts to understand abnormal psychology. They are attempts to deal with the very fundamentals in the development of abnormal psychic states, and we should welcome and utilize these and similar studies for just what they are worth to us when tested by the searchlight of unprejudiced and intelligent examination and understanding. Certainly they recall to our attention apparent facts which can hardly be ignored if we wish to interpret the significance of the psychoneuroses. The influence of fear and of psychic traumata, with reactions in the nature of defense and compensation; the psychogenetic possibilities of constitutional mental trends in the presence of deficient balancing faculties; the effects of moods and mental attitudes; the danger symptoms in psychopathic states and when to commit—all these considerations are of the utmost practical importance to the general practitioner and to the medical specialist if he is to deal most helpfully with his patient. In a suggestive way, therefore, I offer these observations feeling that the teaching of a few fundamental principles in abnormal psychology, together with a few practical points for guidance in actually dealing with psychopathic states, are about all that can be assimilated by the under-graduate and constitute a helpful basis for a practical dealing with his patients when he takes up the practice of medicine.

And finally, it seems to me, it may well be asked, what shall be the responsibility of this great association toward this teaching problem, comprising as it does within its membership nearly all the teachers of psychiatry in the United States and Canada? Shall it disclaim responsibility altogether; shall it be satisfied with the present teaching, which turns out graduates incompetent to deal with beginning psychiatric problems, or shall it advocate a more adequate dealing with the fundamentals in psychopathic states, greater attention to the borderland developments, the bringing of the psychoneuroses within the field of psychiatric

teaching where they belong, and the consideration of certain practical issues to the end that intelligent treatment may be accorded these cases at the hands of the general profession? This, gentleman of the American Medico-Psychological Association, is the question which I would bring before you at this time.

DISCUSSION.

DR. BURGESS.—I listened with a great deal of interest to this paper, inasmuch as I am supposed to be a teacher at McGill University. For twenty-three years I have lectured to the students there and I thought them fairly intelligent. This year I introduced an innovation—I said we will have a clinical examination. Each student of the class was given two patients, cut off from everyone else except a nurse, who was supposed to give all the history the friends of the patient would give. The result was about 50 per cent failed to make good. They got through the examination, but simply because the clinical examination was combined with the written examination; in other words, they literally did not know anything about the subject in the true sense of the word.

DR. WM. A. WHITE.—I have listened to Dr. Hanes' paper with a great deal of interest; it presents a problem which all of us are constantly dealing with. It is a very common thing to see a patient who has been to doctor after doctor for some trouble that does not exist. I teach psychiatry, that is, I lecture on psychiatry. I have ten hours to present the subject in. The medical colleges do not appreciate the necessity of it; it is not all the fault of the teachers of psychiatry.

This case Dr. Hanes has mentioned, of the woman who was unsexed without her consent, is clearly a case of mal-practice according to law; there was absolutely no right on the part of the operating surgeon to do such a thing; it was really criminal to remove those organs without anything being the matter with them. Why do specialists go on giving treatments when they know perfectly well there is nothing the matter? I do not know why unless it is because they get a fee, and they allay their consciences by saying, "It will help the patient." If there is nothing that they can do to help the patient, or they find that the field of helpfulness does not lie with their specialty, why don't they send her to some one who can help her?

There is one thing this association can certainly do. Its members are distributed in all parts of the United States and Canada, and every man can present to his medical societies this aspect of the thing because he will have repeated opportunities to do so. Psychiatrists should not get far away from the general practitioner, because he needs them as much as the patient does. I think such papers as this are distinctly helpful to us to emphasize this question.

DR. BRUSH.—I think the fault in regard to the teaching of psychiatry is not so much with the teacher. I do not know of more than one school that

attempts properly to teach psychiatry. I presume the majority here never heard of psychiatry until after they graduated from medical school. The difficulty also, with the situation is that the patient goes to this and that specialist, and as Dr. White says, why does he treat the case; why doesn't he send him or her away if the case does not require treatment? If he sends her away she will go to somebody else. In order to do as Dr. White has suggested in our medical societies, but primarily in our medical schools, we must insist upon a clearer understanding of the cases by the general practitioner. We have all had experience on this line. Our medical schools must be taught to appreciate the fact that ten weeks, sixteen or twenty-four weeks is altogether too short a time to give any adequate teaching to psychiatry, particularly when the majority of that teaching is given by lectures without any clinical opportunities whatever.

DR. BURGESS.—The fault is not with the teacher, but with the student. You cannot drive it into the average student's mind that you have got to *feel* a thing. Students as a rule cannot grasp that fact. I see a case; I feel the man is insane, but I cannot put my finger on certain indicative facts. You cannot knock it into students that in mental cases they have often to feel that such and such is the case.

DR. HANES.—What I wanted to bring out in my paper was the idea that we cannot learn detailed psychiatry in the medical schools in that way. My feeling is, and what I wished to point out was that it should be toned down to the level of the men; we should not preach over their heads, which is about what the present teaching of psychiatry amounts to.

DEMENTIA PRÆCOX.*

SOME OBSERVATIONS AND COMMENTS.

By EDWARD E. MAYER, A. M., M. D., PITTSBURGH, PA.

That there are various types of psychotic states included under dementia præcox is well understood. We are still unable to definitely separate them. Nevertheless, many clinicians still insist upon ignoring this and whenever they speak of dementia præcox imply in the so-called Kraepelinian sense a progressive deteriorating disease with but one possible outcome. They ignore the fact that Kraepelin's grouping was and remains a tentative one, that he recognizes the occasional possibility of purely psychogenous psychoses having the earmarks of dementia præcox and being branded as such during the attack. It is not therefore incongruous with his views to recognize that manic-depressive symptoms may precede the attack of dementia præcox or that mild types occur especially with constitutional inferiors which are difficult to place in a psychogenous or an incipient dementing class. As long as surface symptoms alone are considered, this difficulty must remain an unsolved one. The attempts to solve this problem by linking the mental symptoms with physiological and neuropathological findings have as yet not succeeded in clarification.

There are undeniably progressive deteriorating cases of dementia præcox who present at death terminal changes such as Alzheimer, Klippel, Zimmerman, Sioli, Southard and others have described. Their connection with dementia præcox is by no means clear, neither stratigraphic nor topographic studies nor cytopathological changes having proved their causal relationship as yet. The various ocular, cutaneous, blood and glandular alterations which have been described, likewise are not definitely either cause or part of the disease. On the other side, the psychologic explanations have attempted the problem of a practical working basis in dealing with the individual who presents symptoms of dementia præcox. Jung, in his "Psychology of Dementia Præcox," attempted to bridge the gap between the two camps with

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

his ingenious hypotheses of a toxin action resulting from the emotional undercurrent included in the suppressed complex and many suggestions have since him been advanced concerning thyrogenous and other toxins.

The clinician to-day must depend upon an exact analysis of each patient's symptoms, not with reference to any similarity to any other disease type, or their relationship to possible brain or gland changes, but as regards the make-up of the particular individual and how his reactions were produced. In other words, he must consider biological and psychogenetical factors rather than neuropathological ones.

The various conditions embraced under such phenomenologic descriptive terms as apathy, emotional torpor, restricted volitional capacity, wax-like flexibility, stereotypy, etc., must be noted and considered, but they will not differentiate individual conditions for us.

An effort must always be made to discover what has caused them, whether any "complex" determinations are in question, and an endeavor made to reach an undercurrent of mental life which, transformed and sublimed, has given us the surface symptoms and moods of the patient. Meyer's conception of imperfect biological reactions with consequent efforts at readjustment, Hoch's personality studies, Stransky's neurologic hypothesis of an intrapsychic ataxia were fruitful. It remained, however, for Bleuler¹ developing Freud's and Jung's researches to give us a deeper insight into the fundamental problems in question. He has shown us that dementia præcox individuals occur who never become actual psychotic patients and that fundamental characteristics of humanity are more potent than the evanescent phenomenological characteristics of Kraepelin.

Whether schizophrenic negativism is found in individuals whose psychosis is not a dementia præcox type, and whether the dementia præcox make-up is not with some (negro?) not only their normal but a normal type representing to an increased degree that myth-forming power of humanity which still lives in dreams and in the psychoneuroses (Jung), are problems which remain to be determined.

¹ Bleuler: *Dementia Præcox oder Gruppe der Schizophrenien*. Aschaffenburg's *Handbuch der Psychiatrie*, 1911.

In order to understand the origin of symptoms, their analysis must probe deeply into the mental attitude of the patient. Psychoanalysis does not necessarily, however, imply a blind follower of Freud. It must give him credit for fixing the importance of individual reactions, of "out of conscious" or expressed thoughts and feelings of making us realize that affective states may detach themselves from the ideas which have given rise to them and create psychotic episodes, and that sublimation and symbolism are potent factors in our psychic life. Bleuler has coined autistic thinking¹ to denote one of the important symptoms of dementia præcox. This is the mechanism of day-dreaming or of sleep dreams which, when it acts continuously, becomes the "twilight states of hysteria or the hallucinatory fulfillment of the wishes of the schizophrenic." He considers negativism² not as a motor phenomenon but as a psychic expression of reaction, both to environment and to thought, and embracing two opposite feeling tones. A dementia præcox make-up, a certain mental attitude, must exist which, under certain influences, dominates the individual, renders him inaccessible to other mental reactions and brings out the characteristic symptoms of the dementia præcox group of reactions. It is not that a dementia præcox patient has a remission as much as that he again becomes able to think logically without pain or distress and that he is no longer compelled to protect his thoughts from hurtful associations. Such a psychogenous origin and termination of an attack in a patient with a dementia præcox make-up need not happen but once in his or her life time. We can readily understand Bonhoeffer's argument³ that there occur psychotic episodes which present the same surface symptoms as does dementia præcox but which are psychogenous and not part of a progressive dementia præcox. We would differ, however, in this respect, in that we recognize that upon individual analysis we find the same mechanism at work in bringing out the symptoms, that many so-called psychogenous psychoses do not differ from dementia præcox types, that dementia præcox groups

¹ Bleuler: Das autistische Denken. Jahrbuch fuer Psychoanalytische, etc., Forschungen. Vol. IV, Part 1, 1912. Compare Freud's autoeroticism and Jung's introversion.

² Bleuler: Zur Theorie des Schizophrenen Negativismus. Psychiatrisch-Neurologische Wchft., Vol. XII, 1910-1911.

³ Bonhoeffer: Degenerationspsychosen. Carl Marhold, 1907.

include some types which are not progressive and perhaps not necessarily deteriorating. That the determination of psychogenous factors is necessary in all of our patients, I firmly subscribe to. This does not imply that we consider such analysis always as of therapeutic benefit or that we must *nolens volens* interpret all the thoughts and actions of our patients as a strict Freudian does.

S. S., æt. 28. A successful salesman and the support of his widowed mother becomes engaged. His mother continually begs him to break his engagement, descending to various lies and innuendoes to influence him. On one occasion she followed him on the next train to the city where the girl lived and was noticed peering through the window in the rain. After being asked in, she stayed and secured her desire of watching the son and interrupting, if possible, any courtship. Finally she obtained his promise to give up the girl, and he started for the train to go and break with her.

Instead of this he married her a few days after his arrival there. Forty-eight hours later he took to his bed with a fear state which had deepened, when I saw him, into a symptom-complex which could only be called dementia præcox. Negativism, perseverations, apathy, delusions of poisoning, stereotyped movements and mannerisms, filthiness in habits were his marked symptoms. Five months later this young man went back to work. His family and friends regard him as normal, but there remains a compensatory defense reaction with a complete aversion for his still virgin wife which shows how readjustment was secured. One complex had triumphed. He has succeeded in shutting his wife out of his mind and in retaining intact his old deep-seated mother love. His wife, he is convinced, deserted him, and thus he justifies his present repudiation of her. Happily both desire a divorce, as his wife, who has returned to her mother, recognizes the true state of affairs and realizes that if he were the former lover with a normal mind he would want to come to her.

Such a psychotic episode illustrates what I have above stated in connection with schizophrenic reactions. It does not necessarily imply deterioration or further attacks. To the onlooker the man is normal. From a phenomenologic point of view he now presents no psychic anomalies. His dementia præcox make-up is given corroboration by his family history. Twelve years ago, shortly before his death, I saw in consultation, his father who presented catatonic symptoms; one brother, long since dead, was diagnosed dementia præcox, and his brother, who committed suicide, was a constitutional inferior with dipsomaniac tendencies.

This young man, unlike dementia præcox properly speaking, had a psychic attack as a result of emotional experiences. True dementia præcox, or at any rate, the type with deterioration and

which tends to progression, does not present a direct connection between cause and effect as with this young man, nor did he evince the degree of disregard and indifference to surroundings which we find with schizophrenics as a rule. But otherwise his symptoms could not be distinguished from those of dementia præcox and were so regarded by several other physicians.

Such patients illustrate what Jaspers⁵ discusses in his recent monograph on dementia præcox in reference to the reactive psychoses in connection with dementia præcox.⁶ "That the thoughts of an individual may be developed logically, must never exclude the recognition that their content may be the result of fears, wishes, emotions, etc., *i. e.*, psychogenetic."

That these may be the result of defects in physiological function does not alter the fact that to the clinician there is nothing in common between physiologic and analytic psychology or, in other words, experimental and understandable psychology.⁷ "The determination of intellectual capacity and deficiency, the question of consciousness, the interpretation of behavior of conduct and of the capacity for work are necessary but do not exclude the necessity of a subjective or analytic psychology." He emphasizes the distinction between explaining thoughts, sensations, hallucinatory ideas, etc., and understanding how acts result from motives, disposition and affect from environmental experiences. He designates by "reactive psychosis" the abnormal reaction of a stationary abnormal constitution to psychic influences and, later, returning to its normal, as distinguished from a productive psychosis in which progression with only partial regression occurs. Every psychiatrist has often seen patients who illustrate this distinction. One example will suffice:

A. D. was a young girl brought up in a very strict household. She was forbidden many of the pleasures of her friends, such as dances and theaters. During her school days, she met the brother of a schoolmate, to whom she became attached. He was very worldly, and displeasing therefore to her mother. Forbidden to go with him, the daughter stopped

⁵ Jaspers: *Zeitschrift fuer die gesamte Neurologie und Psychiatrie. Originalien*. Vol. XIV, Part 2, p. 138, 1913.

⁶ Also Bleuler, *loc. cit.*, who separates a reactive from the productive type of dementia præcox.

⁷ Hinrichsen: *Zentrallblatt fuer Psychoanalyse*, Vol. III, Part 8-9, May, 1913.

eating and cried incessantly, and in a few days became incoherent and distracted when she would speak, which was not often. She would hide under the bedclothes or resist attempts to view her, became inattentive to her toilet and surroundings and developed automatic movements. With changed environment this psychogenous attack subsided within a few weeks. The next month was utilized to instruct both parents and daughter, and in the four years since this has happened no further attacks have occurred.

Either hysteric or schizophrenic is hardly appropriate to such an episode and I would prefer to regard it as a reaction to an experience in the sense which Jaspers uses it. "It is immaterial," as he puts it, "whether such a reactive psychosis occurs with a psychopath, a schizophrenic or an organically diseased individual. The variability of the reactions depend primarily upon the psychic constitution of the individual upon the nature of the psychic experience and upon the structure of the reactive states." It would seem, therefore, that in addition to the progressive type of dementia præcox with deterioration and with the attacks occurring without any connection with exogenous factors, that clinically we cannot ignore a reactive type with recovery without noticeable deterioration and with unmistakably psychogenetic etiology. A reactive type in this sense as a part of the dementia præcox group would not be recognized by many. Some seem to regard non-progressiveness and non-deterioration as irreconcilable with dementia præcox. To the writer, however, the psychogenous psychoses cannot always be separated clinically from the dementia præcox group in the beginning of the attacks.

Bleuler's study of autism and of negativism as a distaste reaction with its two divergent impulses from the normal type through the hysteric to the schizophrenic, is a great help in making this clear. The separation by Kraepelin of the paranoid form of dementia præcox from the other types as paraphrenia, is a very acceptable one to me because it helps to make more understandable the tendencies of Kraepelin to consider clinical symptoms as entities without endeavoring, as does Bleuler, to delve into the mechanism of their origin. To the former the loss of the finer feelings, of shame, of pity (*Zerstreuung* and *Stumpfheit*), etc., is the keynote of the disease; to the latter, *Sperrung*, *Spaltung* and *Autismus* represent the important conditions. His conception is a wider one and tends to connect all the psychogenous diseases

with schizophrenia rather than to separate them as does Kraepelin. Likewise, it allows, therefore, for recoveries or rather readjustments.

Bertschlinger^{*} formulates this very neatly in asserting that the symptoms in dementia præcox types vary with the mode of onset of the breakdown, and the nature of the adjustment that ensues directs the course of the disease.

Adjustment according to him marks the beginning of recovery and may result:

1. By a process of belated sublimation.
2. By a process of desymbolization, *i. e.*, sub-conscious thoughts being brought into accord with the facts of external reality.
3. By a transfer of the complex (temporary recovery).

Adler's^{*} attempt to formulate a broader conception of psychic mechanism in the psychoneuroses includes a fundamental principle which relates to the dementia præcox types as well. Adler regards the effort not to feel inferior, to rise to the level of his companions, an important influence in determining the psychic life of an individual. He lives in this way mentally an unwholesome life, represses everything which does not enable him to act out his purpose. There results an inability to recognize the real; bizarre impulses and actions, as well as ideas, result. Constitutional inferiority of function is, therefore, the basic factor which causes efforts of psychic compensation around which are woven phantasies and motor reactions and which causes stimuli to arise in an effort to develop compensatory increase or hypertrophy of function. This even more than Bleuler's conception of autism reminds one of Janet's descriptions of *perte de la fonction du réel* and of his sentiment *de incompletude*. It is a psychic factor which often occurs, but is a result and not a cause, and not a universal one either.

Adler's hypothesis again brings out the factor of reaction to environment as one which cannot be ignored. Psychic reactions do occur from repressed desires and result in true and secondary actions; the latter occurring as symbols or as sublimation. All psychic life is, however, "not deterministic nor need there always

^{*}Bertschlinger: *Dementia Præcox*: Allg. Ztschft. fuer Psychiatrie. LXV, 1911, pp. 209-222.

^{*}Adler: *Den Nervösen Character*. Bergman, 1912.

be an unconscious connection between the symbolic expression and the complex."

With Jaspers we can conceive of this as an "as if" or out-of-consciousness connection, *i. e.*, understandable but not explainable. A reactive psychosis fulfilling the wish complex of the individual develops, therefore, from experiences in life, subjectively shows itself through the manner of content, phantasies, verbigerations, mannerisms, etc., and points the way to mechanisms and personality alterations ejected from consciousness and yet influencing the individual, depending upon his make-up whether psychopathic or schizophrenic. The two cases I have cited illustrate the occurrence of reactions from environmental experiences upon a schizophrenic background. Such reactions are not spontaneous or continuous, are deterministic in origin¹⁰ and may recede, leaving the patient practically as before. Only the psychology of Freud and Bleuler can explain such types. There still remains, however, among the dementia præcox group, those types which have no environmental factors as a causal influence, but in whom chemical, pathological or genetic causes are alone at play. These are the true types of Kraepelin's dementia præcox, the origin of whose symptoms the future must clear up.

DISCUSSION.

DR. WM. A. WHITE.—I was very much pleased to hear Dr. Mayer's paper. There was one thing suggested by Dr. Mayer's paper and also by Dr. Hoch's paper, and which should be emphasized; that is the question of our attitude towards this class of patients; whether the time has not arrived when we can take a more optimistic view as to the future of these cases. There are two extremes; one is known as the reactive type, of which Dr. Mayer has spoken, and the other the constitutional type. The reactive types complex lie near the surface and so are more capable of removal. Many of our præcox cases get well, and they belong to the reactive type. The constitutional types are productive and deteriorating and the therapeutic outlook is much worse; and yet with the constitutional types something can be done, and something happens whether we do anything or not. It is a matter of observation that those cases who do not get well in the hospital automatically go down to lower levels and when they get to a level at which they are capable of making an adjustment, there they will stay. We should always bear in mind that every patient presumably has a level at which he can get along and live at considerable ease, and so an effort should be made to fit an environment to him, so to speak.

¹⁰ K. Jaspers; *loc. cit.* Practically abstracted.

RECENT TRENDS IN THE PSYCHOPATHOLOGY OF DEMENTIA PRÆCOX.*

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The evolution of the conception of dementia præcox furnishes one of the most interesting chapters in psychiatry. The modern ideas concerning a special deterioration psychosis which usually reaches its culmination or complete development at puberty or adolescence has been the result of a slow evolution, which reached its culminating conception in Kraepelin, whose successful attempt at unifying these various disease pictures, which terminated in dementia, must ever be considered as one of the triumphs of sound clinical observation in psychiatry. The name dementia præcox was first suggested by Pick, although some years previously under the name of katatonia, Kahlbaum had described a puberty-psychosis associated with special muscular symptoms and rapid mental deterioration. In the editions of Kraepelin's "*Lehrbuch der Psychiatrie*" previous to the sixth, dementia præcox was classified under the special category of disorders of metabolism, in common with myxœdema, cretinism and dementia paralytica. Further observation, however, led to a breaking away from this traditional conception and gave to the disorder a special generic grouping, although with a somewhat artificial sub-classification into three different types of the disease. At first the disease was interpreted as a profound disorder of the cortex, and only partially recoverable. More recent advances, however, have led to a considerable modification of this anatomical conception. I refer particularly to the condition described as "allied to dementia præcox," to the partial or complete recoveries or the remissions in the disease and to the marked improvement that may be noted in early cases through a complete psycho analysis, which procedure lays bare the unconscious disturbing complexes. These results would be impossible if the disease were due to actual physical changes in the nerve cells of the cortex.

One of the most prominent riddles of the entire condition lies in the fact that the symptoms of the disease frequently develop

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

parallel with puberty. At first this led to a vague conception that perhaps the basis of the disorder might be an autointoxication from sexual products, a view which was later demonstrated to be utterly erroneous. In addition, dementia præcox frequently shows many features strongly resembling hysteria, such as the delirious episodes, the irrelevant replies to questions, stupor, vasomotor disorders and peculiar disturbances of consciousness. Many of the features of katatonic stupor resemble hypnosis, a phenomenon which led Evenson to conceive dementia præcox as due to a narrowing of the field of consciousness, thus making its mental mechanism correspond to the current French view of the psychogenesis of hysteria. On the other hand, from the standpoint of autointoxication from ductless glands, there is occasionally seen, particularly in katatonic stupor, an enlargement of the thyroid gland, rapid pulse and a myxœdematous thickening of the skin, features strongly resembling hyper or hypothyroidism. However, the indifferent results of thyroidectomy in dementia præcox speak strongly against the disease having any connection with perversions in the secretion of the thyroid gland. I was able to demonstrate a few years ago that intestinal toxic products through absorption, are unable to produce the disease, as the hyperindicanuria so frequently found in the akinetic states of dementia præcox was merely an index of the accompanying intestinal torpor. In fact, when by the use of intestinal antiseptics the indican diminished to normal or almost completely disappeared, no parallel improvement took place in the symptoms of the disease. The chemical examination of the cortex in cases of dementia præcox has likewise yielded nothing of value, at least so far as bearing upon the etiology of the disease process.

Various theories have been proposed concerning the pathogenesis and psychogenesis of dementia præcox, from vague statements of a special predisposition at puberty, especially in cases with an hereditary taint, the hazy autointoxication concept, and, finally, the psychopathological theories. It is with these latter that this paper is particularly concerned. The chief feature in the evolution of the conception of the disease process has been the change from the general clinical view, with prognosis as its chief criterium, to the modern individual psychological analyses.

Probably the most important question in contemporary psychi-

atry is the nature of dementia præcox, that is, the genesis of the disease process. Studies of the cortex, particularly by the French and certain of the German school, are of interest from a histological rather than an etiological standpoint. More recently the disease has been interpreted as a functional process or an inadequate biological reaction, from the standpoint of either an experimental or a dynamic psychology. In addition psychoanalytic methods have penetrated more deeply than was before possible into the mechanism of the disease process, the origin and evolution of the hallucinations, delusions, the so-called emotional apathy and the negativistic phenomena.

Thus there have arisen two camps in the interpretation of dementia præcox: on the one hand, the neuropathologists who sought to trace the condition to an anatomical basis and on the other hand, the psychopathologists who interpret the disease as an inadequate biological reaction, due either to internal (sometimes unconscious) ideas or to external experiences. This latter conception, which has proved to be so fruitful in the elucidation of the mechanism of hysteria and other functional neuroses, has yielded results of great value when applied to the more complex and more inaccessible mental state of dementia præcox. This change in the conception of the disease has been a gradual one, due for the greater part, to the universal application of certain Freudian mechanisms. At first, following the lines of the older psychiatrists, we were satisfied with broad clinical concepts. Yet these concepts, as formulated particularly by Kraepelin and Wernicke, were of immense value for an understanding of the evolution of the general disease picture. More recently, however, individual psychological analyses has been applied to the isolated clinical symptoms and these analyses have furnished the chief data for a more complete understanding of the mechanism of the condition.

Histopathology has demonstrated certain changes in the cortex in cases of dementia præcox, such as satellitosis, atrophy of the association neurones, perivascular infiltration and increase of lipoid substances in the nerve cells. Alzheimer even claims that he can differentiate histologically between katatonia and mania, because the katatonic cortex shows characteristic ameboid glia cells, while these are absent in manic conditions. As a rule dementia

præcox brains show no gross anatomical lesions, while in a few rare cases, particularly in the very acute disease processes with rapid death not due to somatic complications, an apparently normal brain has been proven to be microscopically abnormal, the so-called brain-death (Hirntod in Alzheimer's sense). The histological findings in Hirntod disappear rapidly, and furthermore, the findings may be totally obscured by any concurrent somatic ailment. If these histological changes in the Hirntod are so characteristic for dementia præcox, why is it that they are not more stable and found in more brains, and why do they disappear in chronic cases (where surely they would be most marked), or in cases complicated by severe somatic disturbances? In dementia paralytica, which may be taken as a type of an organic mental disease, the histological findings are invariable in the acute or chronic stage of the disease, in those having a rapid or a slow course, and furthermore, they suffer little or no change by the somatic complications and infections (pneumonia, convulsions, septic processes from decubiti) to which the paralytic dement is especially prone.

This brings us to the crux of the entire question; as to whether or not there is any organic basis to such a disease as dementia præcox, whether these organic changes are primary or secondary in nature and whether they can in any way explain the clinical pictures. The histological findings in the acute, uncomplicated dementia præcox cases (the Hirntod), have furnished no proof as to whether these findings *cause* the disease or are merely fatigue changes due to the katatonic restlessness. It appears, then, that one can never hope for a satisfactory pathological anatomy of dementia præcox, until we invariably find in this disease a uniform cortex picture, such as can be easily demonstrated in the frankly organic mental disorders, such as dementia paralytica, senile dementia, sleeping sickness, amaurotic family idiocy or the fever psychoses. So far as I am aware, this parallelism between structure and function has not been demonstrated in dementia præcox, and therefore, for an adequate interpretation of the disorder we must direct our attention to psychopathology. Certain chromatolytic cell changes which I was able to demonstrate in some cases of dementia præcox, were by no means constant or pathognomic, but were the terminal changes of a central neuritis. This axonal

reaction, in connection with the clinical symptoms of a central neuritis, I was able to find in six cases of dementia præcox.

Both dementia præcox and hysteria show phenomena pointing to a profound mental dissociation. But why a mental dissociation should cause a curable hysteria in one case and an incurable dementia præcox in another, cannot be definitely decided at present, but certainly the difference does not lie in any special cell changes in the brain.

Evenson found a close analogy between some of the prominent symptoms of dementia præcox such as negativism, stereotypy, peculiar attitudes and the reactions of a normal person who has become preoccupied by one thought. He offered the suggestion that the essential features in both the preoccupied individual and in the katatonic were due to a narrowing of consciousness around a central content, and, furthermore, that there existed a close analogy between hypnosis and katatonic stupor.

Bernstein interprets the muscular tension in katatonia as due to a psychomotor disturbance and points out that it must be distinguished from the hypertonicity dependent upon pyramidal tract disease. Vogt also interprets dementia præcox due to a narrowing of the field of consciousness. Gross states that the disease is a dissociation of mental activity and is the expression of a split-off chain of psychophysical processes not related to the conscious personality and therefore escaping introspection. Masselon interprets all the symptoms of dementia præcox as due to a diminution of attention.

Adolf Meyer has pointed out that the disease develops only in those individuals who showed a long-continued and unhealthy biological adjustment and who meet their difficulties in an inadequate manner, and he insists upon the abnormal make-up of those individuals who later develop dementia præcox. In elaborating his psycho-biological hypothesis he points out that the disease is very unlike general paralysis and that the type of deterioration is essentially different. Dementia præcox is due to a conflict of instincts or rather conflicts of complexes of experiences and an incapacity for a harmless constructive adjustment. It is pointed out that this conception of dementia præcox may have a distinct prophylactic value, in that, in some cases at least, the dangerous constellations can be pointed out in time.

August Hoch, as a result of individual psychological analyses, has shown that in dementia præcox as well as in certain paranoic states, the condition develops only in those of a peculiar mental make-up, namely, what he terms the "shut-in personality." In certain analyzed cases, it could be determined that the psychosis represented conflicts and reactions of conflicts which overgrew and developed at the expense of the main and well-adapted interests of the personality. The mechanism of a wish fulfillment and of a shunning of anything which tends to bring up the main trend, is quite common in dementia præcox. This shunning-mechanism explains many of the negativistic phenomena of the disease.

Jung's valuable study is the result of several years clinical work on dementia præcox and gives a logical explanation of the behavior and utterances in this disease, which were formerly interpreted as strange and at random. The rich psychological results embodied in this monograph are certainly a healthy reaction from the vague autointoxication theories and the barrenness of pathological anatomy. In no other disease, outside of hysteria, have purely psychological investigations yielded data of so much importance. There is submitted to a searching analysis the essential psychological features of dementia præcox along the lines of the association studies. The most striking new feature of the work is the tracing of the evolution of individual symptoms and explaining their origin from the unconscious, rather than to interpret these symptoms as strange, inexplicable behavior, the result of the lack of judgment and the primary apathy of the disease.

Careful analyses of the mental state of many dementia præcox cases will show a peculiar blocking of thought and a dissociation of the inner mechanism for will and action. But why one case of mental dissociation should produce hysteria and another dementia præcox, is the crux of the whole question and furnishes a valuable theoretical and practical field for study. This important point Jung has attempted to answer.

In hysteria, the emotional activity has not ceased, but is merely suppressed, while in dementia præcox there is a strong inhibition of the emotions, hence, in the latter disease, the striking emotional apathy. This emotional apathy is superficial, however, for in those dementia præcox patients who are accessible to analysis,

it can be demonstrated that the emotions exist in a latent but very active form in the unconscious. Jung states as following concerning the emotions in dementia præcox: "That the affects in dementia præcox are probably not extinguished but only peculiarly transposed and blocked, we see on rare occasions when we obtain a complete catamnestic view of the disease." In both diseases the essential mental undercurrents may be laid bare by studying the associations to a series of test words and taking the reaction time, thus forming what Jung calls "complex indicators," indicating that the test word is closely related to some hidden complex, frequently of an erotic nature. Many of the random replies in both hysteria and dementia præcox are due to a disorder of the mechanism of association. The complex is frequently symbolically expressed, a symbolism which is best seen in dreams. In fact, there is a striking analogy between the mechanism of dreams and the actions of a dementia præcox patient. As Jung expresses it, "The psychological mechanisms of dreams and hysteria are most closely related to those of dementia præcox. A comparison with dreams is therefore not too daring. In dreams we see how reality is spun with fanciful creations, how the pale memory pictures of the waking state assume tangible forms and how the impressions of the environment adapt themselves to the sense of the dream. The dreamer finds himself in a new and different world which he has projected out of himself. Let the dreamer walk about and act like one awakened and we have the clinical picture of dementia præcox." When the underlying complexes control the entire mental life we have dementia præcox, when they merely lessen the amount of energy at the disposal of the patient, we have hysteria. Thus there exists a close relationship between dementia præcox and hysteria, especially in the various symbolic manifestations of the unconscious complexes. However, Jung is very conservative concerning his psychological origin of the disease, and states, "The mechanisms of Freud do not reach so far as to explain why there originates a dementia præcox and not a hysteria: hence it must be postulated that for dementia præcox there is a specific resultant manifestation of affects (? toxins) which causes the definite fixation of the complex by injuring the sum total of the psychic functions. However, the possibility cannot be disputed that the 'intoxication' may appear

primarily from 'somatic' causes and seize the accidentally remaining complex and change it pathologically."

In 1904, Stransky brought forth the ingenious theory that the fundamental disorder in all cases of dementia præcox was a loss of what he termed the inner unity between the understanding and the will. Especially characteristic was the altered relation between the disturbance of understanding and the corresponding states of affect, so that there arose a sort of sejunction in the sense of Wernicke. To support this theory, Stransky gave a lengthy analysis of a case of dementia præcox, which presented many katatonic features. In brief, this case showed the following disturbances. The patient, who was arrested for petty larceny was at times stuporous, the talk and writing were scattered, he showed shallow and superficial associations, while the actions were clownlike and childish, with an automatic repetition of the movements of others. Attempts to use objects ended in an aimless fumbling resembling apraxia. There was no outward emotional expression, while indecision and helplessness were marked. It was the aimless hesitation in the use of objects and in the execution of orders together with the emotional dullness which furnished a typical example of the loss of the inner unity of the mind or intrapsychic incoordination.

In reviewing this case Stransky pointed out, that while the subject seemed to understand many complicated things, yet on the other hand he was quite simple in manner. From the very beginning, the most prominent disturbance was in the inner unity of the mind, and yet in spite of the prominent superficial apathy, there was no absolute emotional dullness, an observation in harmony with the experimental results of the galvanic and pulse reaction tests. The most marked features of the case were the aimless and senseless hesitation and the peculiar irrelevant execution of actions. For instance, when the patient was given a key and told to unlock a door, he placed his fist upon his abdomen, looked under the mattress and finally went through aimless manipulations with the key, without, however, carrying out the requested act.

There was not an absolute loss of inner unity, but a difficulty and uncertainty in the harmonious workings of all the mental processes. It is this which explains the capriciousness of cases of dementia præcox. Therefore, according to Stransky, dementia

præcox consists, first, in a poverty or superficiality of emotional reactions, and secondly, in an incoordination or ataxia between the emotions and the ideas in consciousness. The disease process is consequently something more than a mere deterioration of the emotions since, indeed, the latter, on close analysis, are found not to be deteriorated at all, but active, though latent, and merely split off (dissociated) from their corresponding ideas. According to this theory, there are two psychical groups, the *noopsyche*, which comprises all intellectual processes and the *thymopsyche* which comprises all effective processes. In a healthy mind these act side by side harmoniously and in unison. As soon as incoordination takes place, there is no longer any unison between ideas and their corresponding affects and therefore the condition known as dementia præcox arises. Unfortunately, unlike Jung and Bleuler, Stransky has no hypothesis to offer concerning the origin or mechanism of this dissociation of consciousness. In hysteria the same mechanism takes place, but here the motive can usually be determined by means of psycho-analysis. In dementia præcox, however, on account of the peculiar blocking of thought, except in some cases, accessibility to analysis becomes very difficult.

These peculiarities of speech and action have more than an ingenious theory of a kind of a dissociation of the inner mechanism for will and action to support them. The exact experimental work of Stransky on speech disorders throws considerable light upon the entire concept. According to these experimental investigations, when there exists a lack of harmony or ataxia between ideas and their corresponding affective processes, there results a superficial stream of thought or superficial associations resembling a flight of ideas. This is particularly liable to take place when the attention is relaxed. In Stransky's experiments, when normal subjects in a state of relaxed attention were requested to make associations at random, without paying attention to what they said, the productions bore a striking resemblance to the speech productions in cases of dementia præcox. In other words there were numerous repetitions, stereotypes, shallow associations and newly formed words and jargon, a kind of a superficial scattering of thought.

Several of my cases of dementia præcox presented interesting examples of these superficial speech productions. One, for in-

stance, would suddenly grab a pencil and paper and write meaningless, disconnected words, like "cat," "Hebrew." Another patient spontaneously produced sentences like the following: "China and a flaxon pretty hand—South America—Plutus keeps pretty hard for Alladin. I am Rupert of Hentzau. I speak as if in a polyshone I am anæsthetic and I said it was a question always at the point of a needle." Another patient, when pressed for a reply to a certain question, would say "I don't care to answer—talking-violent-disease-application—literature—word, deed and action to the place." The resemblance of these productions to condensations and neologisms occurring in dreams is certainly striking.

Unfortunately this theory explains only one aspect of the subject, namely, the emotional indifference and the lack of harmony between ideas and affects. It does not explain the bizarre conduct of dementia præcox patients, the psychogenesis of their delusions or hallucinations or the mechanism of the dissociation, which has been so well done through the psycho-analytic investigations of the Zurich school (Jung and Bleuler). The basis of dementia præcox Stransky believes to lie in an organic disease of the brain, because of the frequent accompanying cyanosis, œdema, increased reflexes, disturbances of pupillary reaction, epileptic attacks, etc. Urstein accepts this theory of intrapsychic ataxia, but believes that the process is caused by certain organic changes in the deeper layers of the cortex.

Bleuler's work is very important for psychiatry, partly because of his broad conception of what constitutes dementia præcox, much broader than in the usual Kraepelinian sense, and partly because of his admirable symptom-analyses. The disease, according to Bleuler, has varied clinical manifestations which frequently take the type of different nosological entities, such as paranoia, the psychoses arising on the basis of a psychopathic inferiority, certain manic-depressive reactions, the prison psychoses and the acute hallucinoses. For him every functional psychosis belongs to the dementia præcox group. This is a rather revolutionary conception, since the trend of modern psychiatry has been to narrow the dementia præcox group, rather than to widen it, as Bleuler has done. His conception is a dynamic one and he maintains that all degrees of transition may exist, from the latent state,

which seems to be merely an abnormality of make-up, to very acute psychoses with varying clinical manifestations. Great emphasis is laid upon the psychological aspect of the disease, although certain somatic symptoms are not over-looked, yet these, as in hysteria, are interpreted as having a purely psychological mechanism, a theory derived from certain psychoanalytic data.

Dementia præcox or schizophrenia is defined as a group of chronic psychoses, with outbursts or remissions, each case showing a more or less clear splitting of the personality and disturbances of associations, but without primary disturbances of perception, orientation or memory. As a sign of the deterioration, we find hallucinations and delusions, confusion, dreamy mental states, manic and depressive emotional fluctuations and katatonic symptoms. The disease is divided into four different forms:

1. Paranoia, with hallucinations or delusion formation in the foreground of the disease picture.
2. Katatonic.
3. Heberphrenic.
4. Simple schizophrenia.

The emotional deterioration stands in the foreground of the disease picture, but sometimes this indifference is hidden by euphoria, anxiety or depression. The shutting within themselves and the lack of contact with the outer world is called autism and seems to correspond to Freud's auto-erotism, Janet's "*perte du sens de la realite*" or Hoch's shut-in personality. The schizophrenic deterioration is characteristic and seems to relate to certain complexes or constellations only. A change of character, either during or after puberty, often marks the beginning of the disease process. This change in character is often of the neurasthenic or hysterical type. A small percentage (about 1 per cent) of schizophrenics die of the disease process, such as convulsive attacks, acute brain swelling or Hirntod. The symptoms at the beginning of the disease bears no relation to the severity of the prognosis.

The mechanism of the disease is a primary dissociation, and this dissociation stamps the entire symptomatology. In many cases there is an unsuccessful attempt to escape from certain complexes which are mostly sexual in nature. Thus the disease is a dissociation of the personality. If the disease process is pro-

nounced, the personality loses its unity, the psychic complex breaks up into fragmentary ideas and the concepts lose their composition. It is this latter process which explains the scattering of thought, which is so frequent in advanced cases of dementia præcox.

Bleuler divided the symptoms into two types—the fundamental symptoms which are present even in the mildest cases of schizophrenia, such as a disorder of the association process (dissociation), and the accessory symptoms such as katatonic states, delusions and hallucinations. It is impossible, within the limits of a paper, to describe all of Bleuler's theories in detail. The original publications must be consulted. However, he has emphasized the psychogenic origin of dementia præcox and believes the pathological anatomy has little or nothing to offer in explanation of the disorder. He says, for instance, "The exact schizophrenic process is unknown. Anatomy shows a slight brain atrophy and certain histological changes. The meaning of these findings is unknown."

Most important is Bleuler's theory of the disease, with particular reference to what he terms ambivalence, the schizophrenic splitting of the psyche and autism, all of which are types of the frequently found schizophrenic negativism. For him katatonic tonus, as a true motor symptom, is very questionable, thus breaking away from the traditional conception of muscular negativism as a condition allied to the various myotonias. Concerning this, he states, for instance, "I have learned to know negativism only as a psychic phenomenon, with its expressions governed by ideas not by anatomical conditions. Also I have been able, up to now, to localize the motor phenomena of schizophrena only in ideas, although obliged to assume that one of the predisposing causes lies outside the psychic area. In negativism there exists an instinctive tendency to conceal the complex." "That the negativistic repelling very often bears the outspoken stamp of the erotic must be due to a root of the negativism being in the sexuality. This is very easily understandable. The sexuality has normally a strong, negativistic component; it shows itself clearest in the opposition of the female against the sexual approach, which we find in animals and also in man, when the sexual act is desired. We know that there is no case of schizophrenia in whose complexes sexu-

ality does not play a prominent rôle, and very often the repelling is founded in sexual delusions, the patients believing themselves loved or violated." Of course these data can only be obtained through a psychoanalysis. I have under my care at present a case showing dementia præcox reactions in which the analysis has demonstrated many of these unconscious sexual mechanisms, some of them clear, some appearing in symptomatic actions and others in a highly disguised and symbolized form in the dreams. Many of this patient's symptoms have disappeared as a result of the psychoanalytic treatment. Thus dementia præcox frequently shows a mechanism of unsuccessful defence, in which the unconscious complexes completely overpower and dominate the conscious. Sometimes the source of these unconscious ideas is unknown to the subject—and since these are usually of a sexual or erotic character, the unsuccessfully repressed material dominates consciousness, so that patients develop the most curious delusion formations to explain the origin of ideas whose source is unknown to them. For instance, one of my patients referred her sexual ideas to telepathic influence, whereas a psychoanalysis demonstrated that these ideas (an Œdipus-complex) had long lain dormant in her unconscious from early childhood. The dementia præcox reactions arise like hysteria and the obsessional states, from the repression of painful memories (usually sexual) into the unconscious and the delusion formation and hallucinations, and even the autistic shut-in personality, is predetermined by the content of the repressed material. The apparent dulling of the emotions in dementia præcox is due merely to the dominance of the ruling complex and the development of the autism. Thus in the etiology of dementia præcox as well as in hysteria, many Freudian mechanisms enter, whose origin can be revealed only by a complete psychoanalysis, either through the association tests or through the analysis of the dreams, since the latter frequently reveal the ruling complex in a disguised and symbolized form.

The data furnished by the psycho-galvanic tests and by my demonstrations of the pulse reactions in dementia præcox, have shown that the emotional apathy on which so much stress has been laid is merely superficial. These tests, as well as the dream symbolisms, demonstrate the presence of unconscious, latent

but active complexes. The emotions are unconsciously quite active in this disease but are dissociated from their corresponding ideas and hence cannot be made use of by the subject. The presence of emotional complexes can also be clearly demonstrated by the association tests. When we come to study the mechanism of the disease, these technical methods must be used for individual analysis and one must not rely entirely upon the data furnished by the anamnesis and the clinical examination. The trend in the psychopathology of dementia præcox seems to show that we are dealing with a dissociation of conflicts or of emotional experiences. With these data in mind and with the establishment of the functional nature of the disease, the prognosis becomes more hopeful. I feel that in the future, in the early cases, at least by means of the data furnished through psychoanalysis, we may be able to devise a rational psychotherapy for the disorder, the same as has been done for hysteria or for certain paranoic states, particularly types of limited delusion formation.

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A PROPOSED CHANGE IN THE CRIMINAL LAW.*

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For several years past physicians in New York State interested in the problems relating to insanity have received from the Committee on the Commitment and Discharge of the Criminal Insane of the New York State Bar Association requests for replies to interrogatories, copies of the committee's reports, and circular letters relating to a proposed change in the criminal law, which would provide that when a jury is satisfied that a person charged with homicide committed the act while insane, the verdict shall be "Guilty but insane" instead of "Not guilty by reason of insanity" as at present. This would in effect incorporate the existing provision of the English law.

The literature of the committee is interesting and informing, and a few references to the reports and letters mentioned will serve to make clear its position regarding this proposed change, especially in relation to the legal points involved. An interrogatory regarding the definition of insanity indicates that the committee's opinion is that it is like fraud, elusive of precise definition, but that as without defining fraud we are still able to say whether a given act is or is not fraudulent, so we may by certain acts and speech prove that a person is insane; but that notwithstanding this fact the question of a man's insanity as generally passed on in the courts has been confused by refinements which would be shown to have no materiality if the inquiry were directed with this fact regarding the definition in mind. Other opinions expressed or implied are that society has no basis for punishing crime other than that crime is an offense against the public weal; that in the case of the indictment of a man for murder, whose defense is insanity, there is no need for a change in the statutory definition of murder, to wit: the killing of a man with intent to kill him; that the whole trouble in the administration of the criminal law in respect to the insane has grown out of a judge-made definition of insanity rather than the statute-made definition of crime; that

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if the proposed change in the law were adopted, those who do violence or other injury, where mental aberration results in unconsciousness of the act in question, would be amply protected against injustice; that in a just administration of criminal law there would be no more stigma on a man or his family by reason of a verdict of guilty but insane than would result from a verdict of not guilty by reason of insanity; that the criminal insane should be cared for apart from the non-criminal insane and the sane criminal, and that the question of continued incarceration should be directed solely to the likelihood of a recurrence of the disorder, this to be determined not as a question of right under habeas corpus as now, but as one of mercy on application for a pardon.

Homicide is defined as the killing of one human being by the act, procurement or omission of another, and is murder, manslaughter, excusable homicide, or justifiable homicide. Murder in the first degree is the killing of a human being, unless it is excusable or justifiable, when committed from a deliberate and premeditated design to effect the death of the person killed or of another.

In the further comment the committee says: "If a jury finds in a given case of homicide that there was no deliberate intent to kill, it may acquit or find a less degree. It can do so as well in the case of the insane as the sane. The trouble is that it has always been assumed that an insane man cannot have any intent, whereas experience has proved the reverse. No sane man has any right to dogmatize as to the intents of the insane. They are inferable from their acts equally with those of the sane. A drunken man is not excused on the ground of lack of intent. An angry man is not excused because he was so angry that he did not know what he was about. . . . A verdict of guilty but drunk would not be illogical. A verdict of guilty while in a fit of anger, which lessened the defendant's self-control, would not be illogical. . . ." The question is not whether an insane man intended to commit a crime but "did he intend the result which came about?" and the report continues: "If on all the evidence the jury finds that the person, whether sane or insane, had no such intent, let them acquit. But if they find that he had the intent, let them convict; and if they also find that he was insane at the time but that his insanity was not of a character to affect his intent . . . let them add that he was insane."

Attention is also called to the following: That insanity is not made the ground for the confinement, but that it is the fact that the defendant killed another with intent to kill him that is the reason for his detention, so that he shall not again be allowed to be a menace to the community; that the objection that the proposed change is unconstitutional falls to the ground because there is nothing in the constitution about the insane man and no insane man has a constitutional right to kill another; and that there is no proposal to be lacking in tenderness or to withhold mercy, and no suggestion that the jury cannot acquit an insane man as well as a sane one.

With the objections hinging on legal points answered by the statements of the committee, we may proceed to consider a little more at length the questions of intent, and the treatment of the criminal from the standpoint of social utility. As the committee's report states that the principal reason given by members of the medical profession for opposing the proposed change in the law is the conviction that an insane person is incapable of criminal intent, this view will be especially considered, and I may state by way of explanation that in making a few suggestions relating thereto and to the questions of responsibility and the effects of discipline, I have in mind the general bearing the facts and opinions set forth may have on the question of the proposed change, which far from contemplating the holding of the criminal insane equally responsible with the sane and punishing them accordingly, does on the contrary especially contemplate caring for them humanely in accordance with present day standards, in a suitable special institution under medical administration.

I will disclaim any intention of discoursing upon the old time topic of monomania or partial insanity or of discussing at any length the questions of free will and determinism but if I suggest these topics my object is rather to call attention to prevailing conditions among criminals, sane and insane, and to certain conceptions of which we may all be aware but which are not always accorded due weight, these points appearing to me to be relevant to the subject of the proposed change in the law.

I believe that those who have had the opportunity for continued observation of criminals, habitual and occasional, sane and insane, are coming more and more to feel that in many respects the pres-

ent-day treatment of criminal cases is far from scientific. I make this as a general statement not as one applying simply to a few cases where the consensus of opinion may be that justice has miscarried. The question which arises is, would not the results be far better and the ends of justice be better served if, instead of attempting to determine in each individual case the precise degree of responsibility existing, and the exact punishment, if any, warranted or required, criminal cases were conducted on the basis of society's right to protect itself, and the greatest resultant good.

Considering the subject of criminal intent in its relation to the insane, in the light of prevailing law and opinion, may we not question the soundness of the premise that it is impossible for an insane person to act with criminal intent? Just what is meant by this assertion? If in all cases of insanity reason were completely dethroned and the alienation such as to unquestionably absolve from all responsibility, the statement might stand unchallenged, but we know that such is not the case. Continued observation of the criminal insane warrants the statement that there are many of the more active among them who, though deranged, react to most of the occurrences of every day life, and commit crime from the same motives as do individuals of the same class who are sane.

Let us consider, for example, the case of a patient with whom the writer has had to do for some fifteen years. A man sixty-three years of age, keen, alert, active, capable; a most interesting character, alive to the events of the day, interested in the political problems of the state and nation and affairs generally; a man who has harbored for years certain absurd delusions but who seldom refers to them except to his older acquaintances among the medical officers and employees of the hospital. This man is a capable farmer, a good mechanic, and an expert horseman. He is of more value to the institution than many of the employees and shows not the slightest indication of mental deterioration except as the impairment of judgment which allows him to accept his delusions as real might be so considered. Otherwise his judgment seems unimpaired, and it is a fact that it is a difficult matter to place an employee at work with him without having the patient, by mere force of character and superior mental ability, assume charge and direct the activities of the employee, with the latter's

more or less unconscious acquiescence. This patient's opinion is sought freely by officers and employees on the various matters with which he is familiar. His reactions to most of the occurrences of every-day life are, so far as observation can determine, as sane as they well could be. Nevertheless, he is unquestionably insane. Now if in so many of the relations of life those who have known him intimately and observed him closely for years are unable to find that his insanity enters at all, in fact, if our observation amounts to anything and we are to base our opinion on the evidence of our senses, such is the case, why must we assume that if he should commit crime (and he once did), the act would of necessity be affected by his insanity? That such a man might commit crime as the result of his derangement no one would of course deny, but if a careful weighing of all the evidence shows sane motive and no other, and the criminal act is manifestly not one due to lack of self-control in the ordinary meaning of the term, why should we disregard the evidence and decide the case on the theory that because the man harbors certain delusions his seemingly sane reactions, if associated with a criminal act, must of necessity be affected by the insanity, and that he is incapable of criminal intent? In other words, is there a mysterious relation existing between insanity and criminal acts which is obliterated when the act ceases to be criminal, so that an insane person who performs a multitude of acts from the same motives as would have moved him to similar activities when sane, cannot, by any possibility, commit crime under the same circumstances and from the same motives as might have caused the same reaction during sanity?

For another example let us take the class responsible for the uprisings and outbreaks in institutions for the convict and criminal insane. While here again there is, of course, no question but that such men may and sometimes do commit crimes as the result of their mental derangement, it is nevertheless a fact that the uprisings referred to are planned and carried out just as they would be by the same class of sane convicts in prison. When the plotting is overheard or brought to light and the participants are interviewed repeatedly and at length, it is the rule that nothing is found connecting any of the motives with the insanity of the patients concerned. In fact, I cannot recall a single instance of

the nature I have in mind where such connection could be established.

Regarding this assumed absence of intent, Maudsley writes as follows: "The medical doctrine by which monomania is held to exclude criminality is founded mainly on three considerations: first, that the delusion might be concealed, wherefore it might be overlooked, although it had actually affected the conduct; secondly, that it is impossible to follow the workings of an unsound mind and to discriminate between a healthy and a morbid action thereof . . . ; and thirdly, that it is impossible to isolate an insane delusion and thus prevent the infection of its morbid nature from spreading."

Now conceding that the existence of an insane delusion may denote an affection of judgment and that "its foundations are not laid in reason," and giving due weight to the considerations just quoted, we can have some understanding of the attitude of those who state that an insane person is incapable of criminal intent. But admitting the truth of the statement that it is impossible to follow the workings of an unsound mind and discriminate between a healthy and morbid action thereof, may it not be contended with equal logic that it is also quite impossible to follow the workings of any mind and fix the precise degree of responsibility for resultant acts, and that while the infection of a delusion, concealed or apparent, may spread, there is in many cases nothing to suggest that it has, and that in such event we could not by any possibility demonstrate that it had; so that notwithstanding the necessary limitations of the mental examination and the possibility of concealment of delusion or the spreading of its infection, we should not allow mere theory, incapable of demonstration, to outweigh to too great an extent facts which have been established, but should settle questions having important practical bearing to society in accordance with the tangible evidence and on the basis of social utility.

As germane to the subject, let us consider the effects of reasonable discipline when applied to the criminal insane, the necessity for which is oftentimes so persistently deplored by those who allow a mistaken sentiment to outweigh judgment. In fact, may it not be that it is this sentiment which has as much to do as well-thought-out opinion in influencing some who object to the

proposed change in the law? In the main, the nature of this discipline is not unlike that enforced in the case of children in the school-room, and it is probably less rigid than is enforced with our young men at Annapolis and West Point. In some respects it is little more than a request for good order and attention, made in an effort to teach the patients, who need the lesson, respect for the rights of others. The patients are expected to take their seats when a medical officer enters the ward. This of necessity to eliminate danger and also to facilitate the transaction of business. In a limited number of cases seclusion in a well-lighted, heated and ventilated room is necessary, as it is in hospitals for the civil insane, though with the criminal class, the homicidal cases more especially, this seclusion is sometimes necessarily of longer duration. A few other reasonable disciplinary measures are required. What is the effect of this moderate discipline? Without hesitation I can state most emphatically that it is beneficial, of much therapeutic value, and aids materially in not a few cases in bringing about a return from insanity to sanity and from a disorderly to an orderly life, and barring the isolation, which is complained of less than one would suppose it would be, I fail to recall a single instance where a patient has complained of such discipline as too rigid, and this in a population where the criminal mind, acted upon by persecutory insanity, causes a certain class of patients to complain unreasonably of about everything that can be thought of regarding which a complaint could be made.

Would not, then, the change suggested by the Committee of the Bar Association, in a sense be giving this same idea of wholesome discipline for the protection of society and the benefit of the individual a little wider application? And if we are to deplore the sad facts of life, should we not in this matter go to the foundation and deplore the very existence of crime and insanity instead of lamenting the need for salutary discipline with the criminal insane, the absence of which in the lives of these unfortunate individuals has contributed so much toward the development of the criminal tendencies and the ultimate insanity?

I make these suggestions advisedly, realizing that if, for example, a gentle and refined woman should become insane and reacting to a delusion of divine command, murder her children, it would be a case to excite pity, and that the imposition of a sen-

tence would seem to be an injustice and the words "guilty" and "pardoned" inapplicable. I am convinced, however, that such cases would be amply protected against injustice. My experience would indicate that while not a few insane persons are tried, convicted and sent to prison, their sanity never having been questioned, cases of the character just described are seldom even carried to trial, as either the verdict of the coroner's jury or some other procedure results in the commitment of the individual to a civil hospital as an ordinary insane person or to Matteawan as a court case.

In our study of sane criminals we are forced to admit that they are in the main the victims of circumstances and cannot be other than as they are. Recidivists are comparable to the incurable insane, as with them reformation is quite impossible and would necessitate an actual re-formation along lines suggested by one of our old paranoiacs, who when writing to public officials regarding the new order of civilization he contemplates establishing, states that he would so regulate society that human beings would be properly formed in their formatories instead of attempting the impossible task of re-forming them in re-formatories.

Criminologists are practically of one opinion regarding habitual offenders. They are the victims of heredity, faulty training, and bad environment, and are so lacking in moral sense that in many instances years of painstaking effort on the part of competent instructors fails to develop any ability to really comprehend what the instructor is attempting to inculcate. It may be said that these men are not normal. With this I agree, but we may question the normality of most men who deliberately commit crime, and there are, of course, many of this class who could not be held as insane. Nevertheless, as a matter of absolute justice, would it not seem that such unfortunates are as much entitled to consideration on account of inability to control their conduct, or because of lack of knowledge of right and wrong, or even because of absence of criminal intent, as are many of the insane? In reality they are helpless, but no one would on this account propose to absolve them from all accountability to society and acquit them and liberate them where the commission of a criminal act had been proved.

The literature of insanity and criminology is not lacking in statements of opinion akin to those here expressed. Ellis, com-

menting on the fact that under existing practice it is considered a matter of much moment whether a criminal is insane or not, states that it is largely a matter of definition, and that even with the best definition we must often be in doubt in a given case as to whether or not it is applicable; that practically it cannot make the slightest difference whether the criminal is sane or insane, as he is in either case a menace and society must be protected from him, and it is our duty to treat him humanely and adopt such measures as will best serve to make him capable of living a social life; that it is unreasonable and anti-social to speak of insanity as a "defense," as it is an explanation but not a "defense," and if we accept it as a "defense" we are directly encouraging every form of vice and crime, because we are removing the strongest influence in the formation of self-control. He relates that when a "defense" of kleptomania was brought before an English judge in a case of theft, he is said to have observed, "Yes, that is what I am sent here to cure," and adds that we need not hesitate to accept this conception of the function of the court, provided always that the treatment is scientific, effectual, and humane.

Now if we go still further and accept the reasoning of the determinist, we find that our charity toward offenders must be extended to include all humanity, as we admit that no individual can at any given moment react to his environment and the multitude of causes acting upon him, other than as he does; and we must then agree with Locke that "it is as insignificant to ask whether man's will be free as to ask whether his sleep be swift or his virtue square." But this is not fatalism, and absence of moral responsibility does not furnish exemption from social accountability, and because of his conviction that all acts, including volitions, are caused and cannot in any instance be otherwise than as they are, the determinist does not reason that effort is useless and social reaction against crime futile. On the contrary, all efforts and methods included in such reaction may become causes acting to determine future behavior, and the determining causes of crime may be discovered and in a measure, at least, removed. We will then accept conditions as we find them but will labor to make them better, and by causing our treatment of the offender to be determined on the basis of social utility, it will tend to become rational

and scientific and a spirit of optimism and charity will replace that of vengeance and retaliation still so much in evidence.

There are benefits which would result from such a change in the law as is now proposed, other than the one the committee has in mind. We all agree that the insane, civil or criminal, should receive care and treatment in suitable hospitals under medical supervision, but it is a fact that many insane persons who have committed criminal acts are convicted and sent to prison, where they not infrequently remain for months, or in some cases years, before the derangement is discovered. There can be little doubt but that this undesirable state of affairs results not alone from lack of systematic inquiry as to the mental condition of accused persons, but also to a considerable extent from the disinclination on the part of jurors, always prone to believe that malingering is far more common than it is, to give reasonable consideration to the question of insanity in cases where it is not of such character as to be immediately evident to the layman. With the law amended so that acquittal would be impossible when the commission of the act was proved or admitted, the suggestion of the possible existence of insanity would have little tendency to arouse the suspicion in the minds of the jury that the accused was feigning, and thorough inquiry and careful consideration of all phases of the question would oftener result. I am convinced, however, that one of the most important results of the change would be the step forward toward a more scientific treatment of all criminal cases.

I believe, then, that our attitude, everywhere, toward such a change in the law as has been suggested should be a liberal one, and that we should not, if the results of such a change would be for the better protection of society and the more scientific treatment of all criminals, be too academic in our consideration of this question of intent; and that bearing in mind the many difficulties which beset us when we attempt to consider the question of responsibility in any case, we should not lose sight of the fact that society's right to protect itself is its justification for the adoption of all necessary efficacious and humane measures in its reaction against crime.

DISCUSSION.

DR. MACDONALD.—I merely wish to say a few words upon a single point in the printed abstract of Dr. North's most interesting paper.

It is a popular notion of the day that the plea of insanity—the so-called "insanity dodge"—is frequently successfully used in the defense of sane criminals, and while it is true that a trumped-up defense of insanity is frequently offered in criminal cases in which there appears to be no other avenue of escape, the fact is that a dishonest plea of insanity very rarely succeeds, such cases as a rule being unmasked and convicted by the aid of medical experts. In an experience of more than forty years, during which I have appeared as an expert witness in thousands of cases in various states and countries, but more often, of course, in the state of New York, I have known but few instances where medical men have lent themselves to a dishonest plea; on the other hand, I have known of many instances of insane persons charged with crime being convicted and sentenced to prison for want of preliminary examination and recognition of their mental condition. So that it may safely be said that the danger to the cause of justice that is supposed to lurk in the insanity plea is grossly exaggerated. The public loses sight of the outcome of these trumped-up cases and erroneously assumes that when such a plea is offered, it usually succeeds, whereas nothing could be wider of the truth.

As to whether a lawyer is ever justified in defending a client on the ground of insanity when he knows said client is perfectly sane, is an ethical question which may properly be left to the legal profession.

DR. WM. A. WHITE.—In regard to the recommendation of the Bar Association, I would say that a person who is insane is legally irresponsible because insanity is a legal and not a mental concept. This is a matter that I think is worth while bringing to the attention of this association. My idea is that there is no such thing as insanity except as a purely legal concept. We know that the brain is not *an* organ which suffers from a disease—insanity, but a tremendous number of organs enclosed in a very small space, each one intimately communicated with the others. There are at least fifty separate organs, and the brain and the mind may suffer from innumerable kinds of disease, but there are only certain kinds sufficient to render a person insane.

DR. FRANK WOODBURY.—I am in entire accord with the writer of this paper. It seems to me that the difficulty hinges on one word—"guilty"—which implies moral claim where there can be no responsibility on account of the condition of the mind. The English Parliament in 1883 passed a special act covering this point, which provides, as nearly as I can give it, that when a person is charged with murder and it is found at the hearing that the person was insane, the trial shall stop at that point and an investigation made as to whether the patient was in condition of mind which would permit him to be held responsible for the act. If it is found that he is insane and not responsible, then the verdict shall be recorded that

he committed the deed, but was insane at the time he committed the act, and, that verdict being found, the judge of the court makes the proper disposition of the case by sending him to a suitable institution to be detained at the pleasure of the court. It seems to me that this is a step far in advance of what we have here. In our state of Pennsylvania we have a verdict of "Not guilty because insane," and then commit the person to a custodial institution for detention, as if he were actually guilty.

DR. NORTH.—I merely wish to say in closing that I do not disagree with the last speaker. No doubt some other term could replace the word "guilty," if that word is objectionable. The idea is to put the treatment of the criminal on a scientific basis; on the basis of social utility, which would result in the best possible solution of the problem. After an experience of fifteen years with criminals, sane and insane, I feel convinced that this would be, for the reasons already stated, a most decided step forward.

THE OCCURRENCE OF MILIARY PLAQUES IN SENILE BRAINS.*

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We are familiar with many of the physiological and pathological changes which occur in the brain and vascular apparatus as old age advances. The mental disorders which accompany these regressions fall into two large groups, the senile disorders and the arterio-sclerotic disorders.

Senility is dependent upon the physiological involution which comes to all sooner or later, beginning soon after the completion of the normal growth usually at the end of or during the fourth decade.

The senile psychoses and the arterio-sclerotic disorders grade away from normal senescence in various combinations. To quote Lambert: "When physiological involution anticipates in time or exceeds in direction, extent, and severity normal senescence, the various senile and arterio-sclerotic disorders are the result."

The parenchyma or working tissue of the organs is the first to deteriorate. The parenchyma of the brain is no exception to this rule and the dementia in senile cases is generally in proportion to the parenchymatous degeneration. The brains of aged individuals show reduction in weight; the convolutions are atrophied and the sulci are correspondingly widened; focal atrophies may occur; the ventricles are dilated and there is usually an excess of fluid in the thickened pia-arachnoid. The nerve cells show varieties of acute and chronic alterations, and many of them show pigmentary degeneration; they are reduced in number. Neuroglia reactions are evident in the form of increased nuclei and thickened feltwork. Corpora amylacea are found in the molecular layer. Arterio-sclerosis may be added; then small wedge-shaped softenings extending into the cortex result from involvement of short cortical vessels. If the process is more purely arterio-sclerotic focal lesions result from involvement of known vessels or systems.

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With these changes we have for some time been familiar. During the last three or four years, however, attention has been re-directed to certain circumscribed foci of tissue alteration frequently found in small or large numbers in the cortices of brains of some senile cases. These microscopic foci are now commonly known as miliary or senile plaques and many conflicting statements are made regarding their origin and significance.

Some of the plaque history and literature is here briefly reviewed. The presence of miliary plaques in senile brains was recognized as early as 1892 by Blocq and Marinesco, and again in 1898 by Redlich, who designated the condition as miliary sclerosis and believed it to be a glial reaction following destruction of ganglion cells. These miliary areas were generally circular in outline and varied in diameter from that of a ganglion cell to a diameter 4 or 6 times as great as such a cell. In 1904 Alzheimer described plaques in senile brains and again in 1906 he described them and associated them with a peculiar intracellular neurofibril degeneration which has since been named after him. In 1906 Dunlap described foci of necrosis in the cortex of the majority of cases of senile dementia with or without arterio-sclerosis. They were designated as pin-point foci of necrosis or senile bodies, consisting of centers of necrotic granular material with a few fusiform nuclei arranged radially in their peripheries, and occasional fat granule cells in or near them. In 1906 Leri advocated a plaque foundation for epilepsy. Fischer in 1907 designated plaques as "Drusige Nekrosen" and could find them only in cases of presbyophrenia. A little later after examining over 100 cases of various psychoses he ascribed to them a bacterial origin and thought them to be characteristic of presbyophrenia only. Achucarro in 1909, using Cajal and Bielschowski methods, described small plaques which occurred very frequently in senile brains but did not express an opinion as to the changes leading to their formation. In 1909 Oppenheim found plaques in the brain of a man dying at the age of 77 without psychosis, Mijake having already described them in senile cases not clinically insane, and since then Alzheimer and Fuller have reported cases dying without psychoses in whose brains were found abundant plaques. In 1910 Barrett, and in 1911 Betts and Fuller reported series of senile cases in which plaques were found. In 1912 Hauptmann described the plaques as he

demonstrated them by a modification of the Levaditi stain for spirochætæ of syphilis in tissue. Within the last year Fuller has reviewed the published reports of a class of atypical senile dementia cases referred to by some as Alzheimer's disease and by others as presenile psychosis and has reported the clinical and anatomical data of one such case. Miliary plaques were prominent in their histopathology. Cases of manic depressive psychoses, alcoholic dementia, arterio-sclerotic disorders, and epilepsy showing plaques have been reported.

Alzheimer's intracellular neurofibril alterations in the ganglion cells of the cortex of senile and presenile brains have been brought into more or less prominence by the search for plaques. Alzheimer describes the condition thus: "In the interior of an otherwise apparently normal cell one or more fibrils, on account of increased thickness or impregnability, stand out prominently. Following this initial change many of the fibrils of the same cell running side by side are changed in the same way and are welded together to form a thicker and more darkly stained bundle which gradually comes to the surface of the cell. At last, the nucleus and interfibrillary protoplasmic substance of the cell disappear completely and only a bundle of fibrils wound into a snarl remains where before was a nerve cell."

It is the purpose of this paper to add the findings in 36 plaque cases to the already abundant plaque literature in an effort to establish a more definite histopathology for senile psychoses and other deteriorations of the senile or presenile period.

The brains of 93 elderly persons dying insane, and of 23 younger persons with a variety of psychoses have furnished the material for this paper. All of the cases came to autopsy at the Binghamton State Hospital.

The 23 younger cases included dementia præcox, general paralysis, manic depressive psychoses, alcoholic psychoses, undifferentiated depression (with central neuritis), traumatic psychoses, epilepsy with insanity, psychoses accompanying chronic internal hydrocephalus, presenile psychosis, and imbecility with insanity. With but one exception, the presenile case, no plaques were found in these cases.

Of the 93 elderly cases, *i. e.*, above 60 years, 35 presented plaques. The 58 elderly cases whose brains failed to demonstrate

plaques included senile psychoses, dementia præcox, allied to dementia præcox, epilepsy with insanity, manic depressive psychoses, alcoholic psychoses, psychoses accompanying cerebral arterio-sclerosis, general paralysis, undifferentiated depression, paranoic condition, imbecility with insanity, and unclassified cases.

ABSTRACTS OF CLINICAL HISTORIES AND AUTOPSY
FINDINGS IN 36 PLAQUE CASES.

CASE I.—J. D., No. 561, male, laborer, 62 years of age, intemperate. Family history is negative for nervous and mental disease except that his father was alcoholic. Until his 60th year there is no history of physical or mental debility. At about that time mental and physical failure began to be apparent and for one year prior to his admission were rapidly progressive. He became dull, apathetic and indifferent; sat in one place day after day; had difficulty in dressing himself, getting his clothes on wrong; strayed away from the house and could not find his way back.

On admission, a man past middle life; well nourished; gait extremely unsteady; tremor of lips, tongue, jaw, hands and legs marked; knee jerks exaggerated; ankle clonus on both sides; weakness of left internal rectus; muscular coordination poor; pupils reacted normally; speech thick; results of examination for cutaneous sensibility unsatisfactory, patient did not cooperate; but the tactile and pain senses were apparently intact; skin circulation was sluggish, hands and feet being cold and cyanosed; lungs clear; cardiac dulness extended $4\frac{1}{2}$ inches left of mid-line, a faint blowing diastolic murmur in the third left interspace.

Mentally an orderly dependent patient whose conversation was irrelevant and incoherent and whose general mental attitude was characterized by indifference, unappreciation and dementia. He had difficulty in the formation and expression of ideas and replied only to simple questions. He was disoriented for time, place and person. Grasp on recent and remote past, retention and school knowledge were very defective.

His mental condition remained much as above throughout his residence in the hospital, physical condition failing steadily. Two days before death the patient was placed in bed on account of weakness. His symptoms were those of cardiac failure and beginning broncho-pneumonia.

Autopsy Abstract.—Brain 1200 grams. Chronic hypertrophic leptomenigitis over the entire cortex with adhesions between frontal lobes, some edema of pia, many small Pacchionian granulations along longitudinal fissure, vessels much thickened and show occasional yellow patches, convolutions all atrophic with widened sulci, brain substance soft, excess of cerebrospinal fluid; chronic endocarditis with aortic insufficiency; slight broncho-pneumonia; chronic interstitial nephritis; general arterio-sclerosis.

CASE II.—M. W., No. 565, a farmer, 79 years of age, with a negative family history for nervous and mental disease except that his father was said to have been peculiar. Naturally he was quick-tempered and talkative.

His psychosis began six or seven years before admission. He was then about 70 years of age. Memory defects became pronounced and gradually he became excitable, faultfinding and extremely suspicious. He developed persecutory ideas which were directed against his children, carried a loaded revolver saying he had been held up several times and had been advised to go armed. Occasionally he became depressed and foolishly jealous of his wife. Repeatedly he threatened to injure members of his family. Frequently he got up at night and wandered aimlessly about the premises. He was committed because he threatened to shoot somebody and "furnish three subjects for the coroner."

On admission, physical examination showed a poorly nourished old man with a kyphosis and a slight lateral curvature of the spine; some cardiac hypertrophy; marked arterio-sclerosis; pupils were small, equal, regular and reacted normally, vision somewhat defective; hearing slightly impaired; station and gait unsteady; ataxia of the finer movements; considerable tremor; deep reflexes exaggerated.

Mentally he showed some deterioration. He was voluble and rambling in conversation and only partially oriented. Shortly he regained his grasp on his surroundings. His general mental attitude was one of cheerfulness in spite of his persecutory ideas in regard to his wife and children. His memory for recent and remote past was poor. He had no insight.

During his residence in the hospital he retained his delusions of persecution; was inclined to ramble in conversation; was childish, forgetful and somewhat emotional. He was careless and untidy of his personal appearance.

He developed a retention of urine and was confined to bed. He was catheterized regularly for two days. After this he lost control of his organic reflexes and never regained them. He developed a cystitis and had a temperature ranging from normal to 103.6. For two weeks preceding his death he appeared exhausted and slept most of the time, but he was easily aroused and would speak when addressed sharply. No paralyses were noted. When questioned he would smile and answer the ward physician but his speech was thick and not readily understood. Several examinations of his urine revealed albumin each time.

Autopsy Abstract.—Brain 1340 grams. Chronic external pachymeningitis, chronic leptomenigitis, excess of cerebro-spinal fluid in ventricles, marked cerebral arterio-sclerosis, convolutions atrophic especially in frontal and occipital lobes, brain substance soft, a large encysted hemorrhage into the posterior limb of the right internal capsule also involving the lenticular nucleus and the optic thalamus, the contained blood was brown in color and apparently three or four weeks old. Chronic endocarditis; marked atheroma of entire aorta, iliacs, and peripheral vessels; infarct in middle of lower lobe of right lung, slight broncho-pneumonia; chronic interstitial nephritis with concretion in pelvis of right kidney; cystitis; chronic interstitial splenitis.

CASE III.—E. C., No. 568, a woman, 79 years of age, with a negative family history for nervous and mental disease. She enjoyed good health until her 76th year. At that time she had what was called "typhoid-pneumonia" following which she was in failing health and coughed considerably. Her mental condition showed a material change after her pneumonia. Her talk became incoherent and she would hesitate and stop in the middle of a sentence; she wandered about the house at night; slept poorly; became uncleanly in her habits; her memory for recent and distant past became very poor. Shortly before her admission she reacted to hallucinations of sight and made assaults upon her attendants without provocation.

On admission an extremely weak and feeble old lady, unable to walk or sit up in a chair, and showing physical signs of consolidation in patches in the lungs; pulse weak and irregular, and a loud blowing systolic murmur over the apex; considerable arterio-sclerosis.

Mentally she showed the symptoms of advanced deterioration; her memory was strikingly defective; her judgment nil; her conversation incoherent with a suspicion of paraphasia. On account of her physical condition no aphasia examination could be made. Disoriented for time, place and person. She became more feeble and her pneumonia increased. Her death occurred after a residence of 14 days in the hospital.

Autopsy Abstract.—Brain 700 grams. Chronic pachymeningitis, chronic leptomeningitis and Pacchionian granulations along the longitudinal fissure, edema of pia, cerebral arteries very nodular and have many yellow plaques, convolutions generally atrophic and sulci widened; chronic interstitial myocarditis; general arterio-sclerosis; lobular pneumonia; fatty liver; chronic interstitial nephritis; chronic interstitial splenitis.

CASE IV.—L. A. V. K., No. 848, a carpenter, 69 years of age, whose maternal grandfather was insane. His father died at the age of 75 of "paralysis." There is no other history of nervous or mental disease in his family. He used tobacco to excess and alcohol moderately throughout his life. Enjoyed good health until November, 1909, when he had an attack of "typhoid fever." The onset of his psychosis dates from this time. He was then 67 years old. He became confused; wandered away from home; slept poorly; began to react to hallucinations of sight and hearing; and developed persecutory ideas and was homicidal toward his wife and nephew. On account of his threats he was committed to the hospital.

On admission, a poorly nourished, aged, decrepit, bent man of medium height and build. Muscles beginning to atrophy; some tremor; tendon reflexes exaggerated; hearing slightly impaired; heart action rapid; moderate arterio-sclerosis; arcus senilis.

Mentally he was quiet and orderly, neat and tidy; evasive when questioned but rambling and incoherent in conversation. He was disoriented; had a judgment defect; memory for remote and immediate past entirely lost; retention poor; insight absent.

During his residence in the hospital he gradually deteriorated mentally. He became restless, confused, and somewhat resistive.

Three days before death the patient had a severe chill lasting about 20 minutes; his temperature rose to 105.4, pulse to 146, and respirations to 30. Physical examination of the chest revealed signs of consolidation in the right lower lobe. Cardiac failure, death.

Autopsy Abstract.—Brain 1400 grams. Calvarium very thin; chronic external pachymeningitis and a marked internal hemorrhagic pachymeningitis with considerable free blood, most marked over the left convexity and both temporal tips, chronic leptomeningitis and edema of pia, many Pacchionian granulations along longitudinal fissure, cerebral vessels greatly thickened, nodular with yellow and calcareous patches, frontal convolutions atrophic; chronic endocarditis; general arterio-sclerosis; lobar pneumonia; fatty liver; chronic interstitial nephritis; chronic interstitial splenitis.

CASE V.—J. C., No. 855, a man, 74 years of age, whose family history was negative for nervous and mental diseases except for one brother who was insane. He was married, a carpenter by trade, abstainer. Since the age of 68 he had shown symptoms of mental deterioration. For one to three years previous to admission he appeared dazed; would wander aimlessly away from home into the woods in the night-time; conversation was incoherent and rambling; he became excited and wrought up over trivial matters; took away tools and implements and could not tell what he had done with them; his memory became more and more impaired. He finally became profane and abusive; struck his wife and son; threatened to cut his wife's head off with a knife; and probably reacted to hallucinations of sight.

On admission, a poorly nourished old man with a slight kyphosis; station uncertain; gait shuffling and unsteady; tremor of fingers; organic reflexes uncontrolled; second aortic sound accentuated; pulse and heart rhythm irregular both in force and frequency; marked arterio-sclerosis. He was very stupid; completely disoriented; and amnesic.

During his two years and four months residence in the hospital he showed the usual symptoms of advanced senile dementia, disorientation, confusion, memory defect, extreme untidiness and filthiness in his habits, and restlessness at night.

In March, 1911, the patient had an attack of influenza and during April, May and June was in the hospital ward several times with chronic bronchitis. He became so feeble that it was necessary to keep him in the infirmary ward. A failing myocardium finally caused his death.

Autopsy Abstract.—Brain 1100 grams. Chronic external pachymeningitis, chronic leptomeningitis and edema of the pia, numerous Pacchionian granulations along the longitudinal fissure, cerebral vessels much thickened and with many yellow plaques, convolutions atrophied and sulci widened especially in frontal and occipital lobes, brain substance soft; chronic endocarditis, chronic myocarditis; general arterio-sclerosis;

pulmonary edema and hypostasis; chronic interstitial nephritis with cystic degenerations; chronic cystitis; large prostate.

CASE VI.—L. D. C., No. 857, a man, 74 years of age. Paternal grandmother died of "shock"; father was alcoholic; mother was insane one year prior to her death; one brother is a patient in this hospital. There is no personal history of nervous or mental disease until the onset of this psychosis at the age of 71 while he was an inmate of an almshouse. The onset was characterized by insomnia, wandering aimlessly about, irritability, confusion especially at night and rambling, disconnected conversation. For a few months immediately preceding his commitment he became rapidly worse. He became more noisy at night and threatened to cut the bowels out of the other inmates.

On admission, a well nourished, fairly preserved old man; slight ptosis of right eyelid; completely blind in right eye due to a scar of the cornea; general impairment of motor functions owing to old age; some tremor; deep reflexes slightly exaggerated; moderate arterio-sclerosis.

Mentally he was childish, elated and talkative. His conversation was irrelevant and incoherent and he was disoriented. He had hallucinations and a marked judgment defect. His memory for the immediate past was entirely lost, for the remote past poorly retained; he had no insight into his condition.

The above was his mental condition throughout. In August, 1911, the patient sustained a subcoracoid dislocation of the left humerus following which he remained in bed the greater part of the time until his death, 6 months later. He failed slowly but progressively, and because of a marked incoordination it was necessary to spoon-feed him after Jan. 1, 1912.

On Jan. 24, 1912, he developed a purulent discharge from the left ear and became much weaker. His temperature rose to 104 and there was considerable spasticity of all of the extremities but no paralyses. He was unable to speak. This condition cleared up completely in a few days. At no time was there tenderness about the mastoid. On Feb. 7 he had a slight chill, became semi-comatose, pulse was irregular and weak; T. 101, P. 96, R. 30. Examination revealed a partial paralysis of the left side of the body, spasticity of the leg and a flaccidity of the arm; the right side of the face was partially paralyzed; he had much difficulty in swallowing. On the next day paralysis was complete on the left side and there was no sensation. An ankle clonus and a patellar clonus were present, but no Babinski. Deep reflexes on the left side were exaggerated, superficial reflexes absent; the left pupil did not react to light. Death, Feb. 9, 1912.

Autopsy Abstract.—Brain 1480 grams. Calvarium thin. Chronic external pachymeningitis, chronic hypertrophic leptomenigitis and edema of the pia, cerebral vessels much thickened, beaded and have many yellow plaques, atrophy of the lower anterior central and frontal convolutions, old softening involving the cortex and marrow in the lower half of the right prefrontal, the right angular and the left occipital convolutions

forward to the internal parieto-occipital fissure, some lacunar softenings in the left lenticular nucleus; chronic interstitial myocarditis, chronic endocarditis; advanced general arterio-sclerosis; pulmonary congestion and edema; fatty liver; chronic interstitial nephritis with cystic degenerations.

CASE VII.—J. H. Y., No. 862, a farmer, 75 years of age, whose father was an epileptic. He was a man of fair habits and cheerful disposition. In his younger years he was a periodic drinker but never had delirium tremens or any hallucinatory episodes. Many years ago he was thrown from a wagon and received a slight injury to his spine. Had typhoid fever, pneumonia and rheumatism many years ago. No other accidents or illnesses. The change in his mental condition is said to have taken place about four years previous to his admission to the hospital, at which time he began to show loss of memory; he was a little depressed, and at times wandered aimlessly about and was not able to do any work.

His mental condition gradually grew worse and four weeks prior to his admission he became very active; moved furniture about the house; thought that he was driving cows and horses; was very excitable; tore his clothing; slept little at night; picked at the carpet and bed clothing; was profane and threatened to kill himself and his wife; he was very much confused.

On admission to the hospital, a poorly nourished old man showing well-marked senile changes; respirations 26 per minute; rales over bronchi and lower and middle right lobes; temperature 99; no cough; heart dulness increased to left and there was a mitral systolic murmur; arteries somewhat thickened; blood pressure 140; hearing slightly impaired; eyes normal; tremor of tongue and fingers; deep and superficial reflexes normal.

Mentally the patient was confused and restless; he was disoriented; had no appreciation of his surroundings; his memory, judgment and retention were much impaired; he was noisy and resistive.

On the second day after his admission he developed an acute diarrhoea from which he suffered for three days. This condition improved. His confusion increased steadily. One day before his death his respirations were hurried but his temperature was normal. Examination was difficult on account of the patient's continuous mutterings. A few rales were heard over his bronchi and right lung. About 10 hours before death there was considerable muscular rigidity with a slight twitching of the pectoral muscles and of the fingers; his legs were extended and his eyes were fixed. He died five days after admission.

Autopsy Abstract.—Brain 1280 grams. Some external pachymeningitis, pia much congested and very edematous, thickened and opaque, vessels all greatly thickened and with many yellow nodular plaques, excess of cerebrospinal fluid outside of the brain, convolutions atrophic in upper left central and in frontal and occipital lobes, no foci of softening; heart had atherosclerotic coronaries, hypertrophy of myocardium in wall of left ventricle,

mitral insufficiency; aorta and peripheral vessels very atheromatous; broncho-pneumonia; chronic interstitial nephritis.

CASE VIII.—D. C., No. 867, a widow, about 88 years of age. Nothing is known of her family or personal history. Her psychosis is said to have begun in her 75th year. At this time she spent the greater part of her time sitting around in grocery stores telling about her importance and about the property which had been taken from her. She annoyed all who came in contact with her by asking for money and property. She was noisy day and night.

On admission, at the age of 75 (?), she was in good physical condition. Mentally she was exalted and garrulous, had poorly systematized persecutory ideas. Early notes state that her condition was then one of terminal dementia.

During her 13 years residence in the hospital she was much deteriorated mentally. Her memory was poor; she was disoriented for time, childish, excitable and talkative; at times became fearful on account of her delusions. She gradually failed physically and was in bed on account of general weakness and failing functions for 5 months preceding her death.

Autopsy Abstract.—Brain 1018 grams. Dura very adherent to calvarium, pia thickened and opaque over vessels and sulci, vessels generally greatly thickened, very nodular and have many yellow plaques, all of the convolutions are atrophic and sulci are widened, especially marked in frontal and occipital lobes, left first and second temporal convolutions and temporal tip have largely disappeared owing to an old softening, a small old softening in the left postparietal, these softenings extend into the marrow but not deeply, a small old softening in the posterior part of the genu of the corpus callosum; chronic interstitial myocarditis; advanced atheroma of the aorta and peripheral vessels; fatty liver; chronic interstitial nephritis.

CASE IX.—S. W., No. 868, a woman, 71 years of age, who had one sister "mildly insane"; father was excessively alcoholic. Aside from a fall down stairs at the age of 67 when her head was cut slightly she has never had any severe traumatism or illness. She had been a woman of good habits and good morals; was the mother of 6 children, one of whom has been insane (type of psychosis unknown) for the past 14 years. Her psychosis was first noticed about one year previous to her admission at which time her memory began to fail; she was irritable; developed the idea that harm was coming to her; was destructive of her clothing and furniture and at times did not know the members of her own family; she became very noisy, active, profane and obscene.

On admission, a feeble old woman showing well-marked senile changes; she had a soft mitral systolic murmur; arteries showed considerable sclerosis; blood pressure 180; marked arcus senilis; severe diarrhoea; taste, smell and cutaneous sensibilities could not be determined as she was in a very feeble condition and her mental condition was such that she could not co-operate; marked tremor of tongue and fingers; deep reflexes normal.

Mentally she was noisy, restless, confused and resistive; did not appreciate her surroundings; was disoriented for time, place and person; her memory, grasp, judgment and retention were very poor.

During her residence in the hospital she presented the same condition as on admission. At times she was irritable and profane; she gave no evidence of visual or aural hallucinations; she refused food and had to be forcibly fed; the diarrhœa noted on admission continued for one week and so weakened her that she was compelled to remain in bed. She died suddenly 31 days after her admission.

Autopsy Abstract.—Brain 1300 grams. Pachymeningitis hemorrhagica interna over frontal, central, and parietal regions on the left side, pia was opaque and thickened and showed marked edema, vessels very thin with occasional yellow patches, focal softenings involving only the cortex in the second and third right temporal convolutions and the third left temporal, a small acute softening in the left angular gyrus; chronic endocarditis; marked atheroma of the aorta and peripheral vessels; chronic interstitial nephritis.

CASE X.—H. B., No. 870, a woman, 78 years of age, with a negative family history for nervous or mental disease. Her habits and morals had always been good. She had always been nervous. Had typhoid fever twice and pneumonia once many years ago; she is said to have suffered from epilepsy for many years but this statement has not been confirmed. Her psychosis is said to have come on about three months before her admission. She became nervous and her memory showed considerable defect. After a change of residence she became restless; threatened to commit suicide; threatened her husband's life; danced, sang and tore her clothing. She made attempts at suicide once by choking herself and once by taking poison; she threw dishes and furniture; at times she was much excited.

On admission, and old woman showing well-marked senile changes. Hearing was impaired; slight tremor of tongue and fingers; deep and superficial reflexes normal; heart enlarged to the left and the second mitral sound was replaced by a murmur; also a diastolic murmur at the mitral area, second aortic sound replaced by a soft blowing murmur; arteries much sclerosed; blood pressure 110; edema of feet and ankles; urine showed considerable albumin, many epithelial cells, hyalin and granular casts, a few pus cells and red blood corpuscles.

Mentally she was slightly depressed, dull, irritable, inclined to be uncommunicative; gave evidence of hallucinations of hearing; was disoriented; memory and judgment were very defective and she was much confused; she had little insight into her condition.

During her residence in the hospital she remained depressed, confused, at times mildly agitated and showed considerable mental deterioration. For some time she refused food and it was necessary to tube-feed her. Her physical condition failed steadily and she died 41 days after her admission.

Autopsy Abstract.—Brain 1200 grams. Dura thickened and adherent to frontal and parietal bones, pia thickened over sulci and much congested over left second frontal, lower ends of anterior and posterior central, and supramarginal gyri, considerable edema, vessels all thickened and have numerous yellow plaques, convolutions are atrophic in frontal and slightly so in central regions, brain substance soft; chronic endocarditis (mitral stenosis); aorta and peripheral vessels show advanced atheroma; small abscess in lower lobe right lung; chronic empyema of gall bladder with gall stones; chronic interstitial nephritis; perisplenitis.

CASE XI.—S. B., No. 429, a man, 65 years of age. Unfortunately we have no family or personal history except that his commitment paper states that he had shown periods of excitement. He had been in various hospitals for the insane for about 35 years. Early hospital notes state that he was quiet and orderly, dull, and much deteriorated.

On admission to the hospital, he was 61 years of age, poorly nourished, posterior curvature of dorsal spine, lungs normal, a blowing systolic murmur at cardiac apex.

Mentally he was much deteriorated, had no insight into his condition, was completely disoriented and had very poor memory for recent and distant past; he was untidy and careless of his personal appearance; talked and laughed to himself.

During his residence in the hospital (4 yrs. 4 mos.) his mental condition did not change materially. Two hours before his death while walking across the room he suddenly staggered and would have fallen but for assistance by a fellow patient. He became comatose; no physical signs of paralysis; temperature normal; pulse 100 and of good quality.

Autopsy Abstract.—Brain 1280 grams. Dura and pia normal. Vessels of base and smaller vessels nodular with yellow plaques; fine granulations in ventricles, some atrophy of frontal convolutions, acute softening of left temporal tip and of cortex of amygdala of cerebellum, medullary portion of left cuneate lobule entirely softened, the cortex being slightly involved but this not showing on the surface; chronic interstitial myocarditis, mitral insufficiency; aorta and peripheral vessels show advanced atheroma; congestion and edema of lungs; passive congestion of liver.

CASE XII.—E. M., No. 886, an unmarried woman, 53 years of age, laundress. There is no history previous to June, 1908, when she was sent to the City Home in N. Y. City. While there she tried to jump off a balcony; was melancholy and depressed; complained of a loss of memory. On admission to Manhattan State Hospital July, 1909, physical examination showed over-active reflexes, coarse jerky tremors of the tongue, slight degree of peripheral arterio-sclerosis, unequal pupils which reacted well. Lumbar puncture gave a negative reaction.

Mentally she was a little confused, childish and irritable, poorly oriented for time and place, did not appreciate her surroundings, memory poor for both recent and remote events; retention, grasp on general knowledge,

counting, calculation and reading and writing all poor. Insight lacking and judgment defective.

During her residence in Manhattan State Hospital and after her transfer to the Binghamton State Hospital in March, 1910, her mental condition did not change materially. In July, 1910, an abscess developed in the lower dorsal region. It gradually extended in circumference and depth and emitted a foul discharge. She failed steadily and died of exhaustion.

Autopsy Abstract.—Brain 1200 grams. Dura slightly thickened and adherent to the calvarium, chronic leptomeningitis over sulci and over first left frontal convolution, atrophy of the frontal, especially the left frontal, and of left angular gyrus, blood vessels show yellow nodules throughout, minute softening in middle of left lenticular nucleus, brain substance soft; hypertrophy of myocardium in wall of left ventricle, coronaries thickened; advanced atheroma of the aorta and of the peripheral vessels; chronic interstitial nephritis; uterus and ovaries atrophic; large abscess with several openings involving the skin, subcutaneous tissues and muscles in the lower dorsal and lumbar region.

CASE XIII.—A. R., No. 889, a widow, 62 years of age. No family history obtained as she was brought to the hospital from the County House. No personal history. Her psychosis is said to have developed at the age of 58; gradual in onset. She became violent and threatening; talked irrationally; wandered away from the house in the snow in her bare feet.

On admission she showed physical signs of senility; complained of occasional headaches and vertigo; poor musculature, coarse tremor of hands, unsteady gait and incoordination of old age; deep reflexes exaggerated, superficial normal; high-pitched mitral systolic murmur transmitted into axilla; arteries moderately sclerosed; edema of feet and ankles.

Mentally she was quiet, confused, wholly disoriented, unappreciative of her position, memory for remote and immediate past very defective, retention, grasp on school acquirements and current events, and calculation very poor; hallucinations of sight and hearing.

During her two years and three months residence in the hospital she gradually became more demented and failed physically. In the fall of 1911 she was so feeble physically that she remained in bed. Her urine contained albumin and casts. She finally developed a temperature, some evenings it reached 103.6. She exhibited a marked tremor in her extremities and in the muscles of the face and neck, the tremor in the extremities being more marked whenever any movement was attempted.

Autopsy Abstract.—Brain 1160 grams. Pia opaque over sulci, some Pacchionian granulations and thickening along the longitudinal fissure, edema over both frontal lobes, all vessels contain many yellow patches but there are no apparent occlusions of the lumen, frontal convolutions much atrophied and sulci widened, motor convolutions slightly atrophied, ventricles somewhat distended by clear fluid, no granulations, no softenings; hypertrophy of the myocardium in wall of left ventricle, myocardium very soft and flabby, coronaries beaded and calcareous, chronic endocarditis,

mitral stenosis and insufficiency; aorta and peripheral vessels very atheromatous; acute congestion of liver, 540 small gall stones; chronic interstitial nephritis; uterus atrophic; large cyst of left ovary containing clear straw colored fluid filled the lower left quadrant of abdomen.

CASE XIV.—W. E. T., No. 898, male, cooper, 78 years of age, moderately alcoholic. Father was alcoholic; one brother had an attack of "acute mania" from which he recovered; one sister had an attack of undifferentiated depression from which she recovered; another sister and a paternal cousin were said to have been insane but were never committed. He had always been well until the onset of his psychosis at the age of 78 when he worried much over the death of a friend. He became confused, slept poorly at night, developed delusions that his wife and others had robbed him, had hallucinations of sight and hearing, repeatedly threatened his wife and struck her. He fabricated freely.

On admission to the hospital he showed well marked senile changes, arcus senilis, marked arterio-sclerosis, blood pressure 175. He was weak, troubled by dyspnoea and somewhat cyanotic. Cardiac hypertrophy, mitral insufficiency, edema of feet and ankles. Urine showed albumin and granular casts. Muscles were flabby and showed fibrillary twitchings; coarse and fine tremors; and slight ataxia of movements of upper extremities.

Mentally the patient was confused; his answers were irrelevant; he took no interest in his new surroundings; was disoriented for time, place and person; his memory for recent and remote past was poor and he had no insight into his condition. A typical senile deterioration.

He died 17 days after admission. Compensation of his mitral insufficiency failed steadily. During his residence at the hospital there was no change in his mental condition.

Autopsy Abstract.—Brain 1420 grams. Thickened and adherent dura, edema of pia, cerebral vessels generally thickened with many patches of yellow atheroma even in smallest vessels, atrophy of frontal convolutions, lacunar softening in posterior part of left optic thalamus and left lenticular nucleus, softening of cortex of amygdala of cerebellum on each side; marked hypertrophy of heart, both ventricles dilated, chronic endocarditis with calcareous valves; advanced atheroma of all arteries; congestion and edema of lungs; passive congestion of liver; chronic interstitial nephritis; perisplenitis; chronic cystitis.

CASE XV.—M. C., No. 906, a housewife, 79 years of age. Unfortunately there is no family or personal history as she was admitted from the County Almshouse and had no known friends. She had lived in the almshouse 4½ years and had been in good health. At 76 her first known psychosis developed. She became restless at night, talked loudly to imaginary beings, threatened to kill other inmates of the almshouse, removed her clothing in public places and was uncleanly in her habits. She was committed about two months after the onset.

On admission to the hospital she showed characteristic senile changes. She required assistance in walking (gait was shuffling); had a coarse tremor of the hands and poorly coordinated movements of the arms; arcus senilis; deep and superficial reflexes diminished; general arterio-sclerosis.

Mentally she reacted to hallucinations of sight and hearing; her memory for remote and recent past was very defective; she was disoriented for time, place and person; had no insight into her condition. She was confused and her answers to questions were often irrelevant.

During her residence at the hospital she was often restless and noisy at night in reaction to visual hallucinations; she frequently assaulted other patients without provocation. She would get lost on the ward; was untidy and often wet and soiled her clothing and bedding. She suffered frequent attacks of rheumatism and was confined to her bed for four months before her death by general physical debility. A few days before death she developed some temperature with corresponding pulse and respiratory rise. Temperature before death, 106.

Autopsy Abstract.—Brain 1180 grams. Dura thickened and adherent to calvarium, edema and congestion of pia over frontal lobes, vessels thin, fine granulations in fourth ventricle, convolutions atrophic in frontal and central regions; advanced aortitis; peripheral arterio-sclerosis; congestion and edema of lung and caseous bronchial lymph glands; gall stones; chronic interstitial nephritis.

CASE XVI.—J. B., No. 908, farmer, 79 years of age, with a negative family history for nervous and mental disease. His health is said to have been good until the onset of his psychosis at the age of 77. At that time his memory began to fail; he lost interest in his surroundings; developed persecutory ideas; was fearful; did not recognize members of his family. Mental and physical failure were steadily progressive. He finally threatened to kill his wife; became very active, was destructive of furniture and clothing; careless of lamps and matches and slept poorly at night.

On admission to the hospital he was feeble and poorly nourished; gait trepidant; coarse tremor of hands and legs; some ataxia; knee jerks absent, abdominal, elbow and wrist reflexes present; no ankle clonus; no Babinski. Cutaneous sensibilities normal; arcus senilis. Moderate emphysema; arterio-sclerosis with hypertrophy and endocarditis, a double mitral lesion, blood pressure 170; some cyanosis of lips, ears and extremities.

Mentally he was confused, restless, disoriented and amnesic. Evidences of aphasia were noted but owing to the confusion and restlessness it was impossible to carry out an examination.

During his 14 days residence at the hospital the patient exhibited the same symptoms as on admission. He picked at his bed clothing and frequently left his bed and rushed aimlessly about the ward. He lost flesh and strength rapidly. Failure of compensation of the heart lesion resulted in his death.

Autopsy Abstract.—Brain 1350 grams. Dura slightly thickened, pia thickened and edematous, vessels at base atheromatous, convolutions generally atrophied with widened sulci, most marked in frontal, lacunar softenings in left lenticular nucleus; chronic endocarditis of mitral, tricuspid and aortic valves; atheroma of aorta and peripheral vessels; liver infiltrated by firm carcinomatous nodules; chronic interstitial nephritis; carcinomatous new growth of tail of pancreas; a Meckel's diverticulum 18 inches above ileo-cecal valve.

CASE XVII.—A. D. B., No. 919, a farmer, 75 years of age. His father died at 70 from apoplexy. His mother was insane; one brother committed suicide at 20; another brother was twice a patient in the Binghamton State Hospital, once in a depressed attack and once in a manic attack, recovered each time. He is said to have always been "queer" but got along well with his associates. He is said to have had several attacks previous to the onset of the last psychosis but the time of their occurrence or their nature is unknown. The onset was rapid. He became restless, talked to himself, had hallucinations of sight and hearing and reacted to them; memory for recent events became poor. Finally he attacked a relative with a pitchfork.

On admission to the hospital, five days after the onset of the psychosis, his gait was somewhat unsteady; slight tremor of hands and tongue, incoordination of finer movements; arcus senilis, right pupil larger than left, both pupils irregular and failing to react to light; superficial and deep reflexes active; general arterio-sclerosis; some attacks of vertigo.

Mentally he was quiet and orderly, rather voluble, but had some difficulty in expressing himself. His memory for recent events was defective, better for remote past. He had a few poorly systematized ideas of a persecutory nature directed against his wife. Admitted seeing visions of Christ, with whom he talked. He was untidy and careless of his appearance and had vermin in his hair.

During his residence in the hospital mental deterioration was steadily progressive but slow. He was occasionally irritable and noisy but these attacks were of short duration (24 hrs.). He retained his persecutory trend and occasionally spoke of himself as Christ.

Four years and eight months after admission the symptoms of apoplexy suddenly developed one morning shortly after arising. He became unconscious, fell from his chair; had clonic convulsions of the extremities; face cyanotic, pulse slow and full; respirations slow and approaching Cheyne-Stokes type. He died in 2 hours.

Autopsy Abstract.—Brain 1380 grams. Dura thickened and adherent to skull, chronic leptomeningitis over frontal and along longitudinal fissure, cerebral arteries all greatly thickened, beaded and tortuous, some atrophy of frontal and occipital convolutions with widened sulci, a hemorrhage with tearing of brain tissue into pons opening into the fourth ventricle; cardiac hypertrophy, chronic endocarditis; general arterio-sclerosis of advanced type; chronic interstitial nephritis.

CASE XVIII.—M. L., No. 920, female, dressmaker, 85 years of age. No family or personal history except that two sisters were insane, types of psychoses unknown. She had been gradually failing physically for some months before the onset of her psychosis at 84 years. The onset was gradual. She became uncleanly; wandered about at night with a lighted lamp without a chimney, set fire to her clothing several times; did not eat sufficient food. Her memory and judgment became very poor.

On admission to the hospital, a poorly developed and nourished old lady presented. Gait feeble, slight tremor of tongue and hands, exaggerated patellar and plantar reflexes; marked arcus senilis; marked general arterio-sclerosis, blood pressure 150 mm.; taste, smell and vision impaired; cutaneous sensibilities retained; systolic murmur at apex of heart; urine contained albumin and pus.

Mentally she was quiet, amnesic and disoriented for time; had no insight and was inclined to fabricate.

During her 14 months residence in the hospital mental and physical failure were steadily progressive. Memory and judgment defects became pronounced. She fell several times while walking about the ward and finally came to spend most of her time on a couch because of general weakness and failing vision. Ten days before her death she fell from her couch and examination revealed a spastic paralysis of the left leg; two days later the left arm showed a flaccid paralysis while the left leg remained spastic. Both patellar reflexes were absent. There was no pupillary or facial paralysis. Bladder and rectal reflexes were soon lost.

Autopsy Abstract.—Left pupil larger than right. Brain 1080 grams. Dura thickened, pia very edematous, chronic leptomenigitis over frontal, left anterior central and along the longitudinal fissure, all of the cerebral arteries contain many yellow plaques and have thickened walls, convolutions are all atrophic with widened sulci, some pitting of surface of cortex, a large softening involving the right middle and inferior occipital and cuneus cortex and the underlying marrow cutting off the optic radiation, many lacunar softenings throughout the marrow and in the right lenticular nucleus; chronic endocarditis; general advanced arterio-sclerosis; small areas of broncho-pneumonia; chronic interstitial nephritis.

CASE XIX.—M. N., No. 932, widow of a farmer, 75 years of age. Satisfactory family and personal history unobtainable. One brother and one sister were insane, types of psychoses unknown. There is a history of three apoplectic attacks; two several years before admission (at about 70 years) and one during her 75th year. After her last "shock" her speech was affected and she became irritable, noisy and at times violent. She attempted to run away from home; moved articles of furniture about; walked about her home at night doing strange things. She finally developed persecutory delusions regarding property and threatened to kill those about her. Her memory and judgment were very poor.

On admission to the hospital an emaciated, weak, poorly developed, senile woman presented. She had some difficulty in speech and swallowing;

was very deaf; mitral insufficiency poorly compensated; marked arteriosclerosis with blood pressure 160; arcus senilis; pupils irregular and unequal, varying from time to time, reaction to light sluggish; deep and superficial reflexes normal; albumin and pus in urine; a large hard tumor mass in lower abdomen.

Mentally she was much confused, disoriented, very amnesic, irritable and expressed some vague persecutory ideas. A satisfactory examination was impossible on account of her deafness and extreme physical debility. Three days after admission she fell and fractured the neck of her left femur. She failed steadily, developed pressure sores and died after a hospital residence of 41 days.

Autopsy Abstract.—Brain 1250 grams. Chronic external pachymeningitis, chronic leptomeningitis over frontal and lower central convolutions and along the longitudinal fissure, congestion and edema of the pia throughout, advanced atheroma of the cerebral arteries, convolutions generally atrophic most marked in frontal and central, an old brown hemorrhage into the entire length of the outer portion of the left lenticular nucleus extending into the anterior and posterior limbs of the internal capsule and involving nearly all of the external capsule; heart hypertrophied, chronic endocarditis; general advanced arterio-sclerosis; congestion and edema of lower lobes of lungs; chronic interstitial nephritis; purulent cystitis; calcareous submucous fibroid of uterus 5 inches in diameter.

CASE XX.—J. K., No. 936, farmer, 74 years of age. One son was insane, type of psychosis unknown. No other family history of insanity. At the age of 60, following a sunstroke, he developed a psychosis characterized by depression, a mild persecutory trend, poor memory for recent events but fairly good for remote past, subjective symptoms of vertigo, and he had a mild convulsion. It was necessary to commit him to the hospital. He improved somewhat and was discharged after one year. At the age of 67 he fell from a horse and mental failure was more pronounced. At 68 there was a marked memory defect, delusions of persecution and poisoning, confusion and homicidal attacks on a neighbor with an axe. He wandered about at night and was excited.

On his second admission to the hospital he had a lacerated wound on the left forehead and a scar over the right parietal eminence; was well nourished; station, gait, reflexes normal; coarse tremor of hands; general arterio-sclerosis; systolic murmur over aortic region; senile in appearance; complained of dizziness.

Mentally he was amnesic, confused and completely disoriented, and he had no insight into his condition. He expressed many poorly systematized delusions of a persecutory nature directed against his neighbors, and apparently reacted to hallucinations of sight and hearing. He fabricated freely.

His residence in the hospital was uneventful. He was a querulous old man with a poor memory. He frequently became excited when he would

talk volubly and occasionally assault. Mental and physical failure were progressive. He had glycosuria for over one year before his death. Death resulted from acute pyelonephritis.

Autopsy Abstract.—Brain 1240 grams. Chronic external pachymeningitis and chronic internal pachymeningitis hemorrhagica over both convexities and orbital lobes, chronic leptomeningitis, edema and congestion of pia, marked atheroma of cerebral vessels, convolutions generally atrophic, marked atrophy of frontal; chronic endocarditis, mitral insufficiency; marked general arterio-sclerosis; acute pyelonephritis of left kidney; acute purulent cystitis.

CASE XXI.—A. S., No. 943, female, aged 85 years. Unfortunately there is no family or personal history until she became an inmate of the Blackwell's Island Almshouse at the age of 63. At this time she expressed many persecutory ideas believing that she had been defrauded of money and reacted to hallucinations of hearing. Her manner was silly and childish; she was restless and wandered about gesticulating, talking and shouting at other inmates. She was admitted to Manhattan State Hospital in 1901. While there she was noted as demented, noisy and scolding at times, exhibiting delusions of persecution and reacting to hallucinations of hearing. Upon admission to the Binghamton State Hospital in 1905 at the age of 78 years, she was orderly, had persecutory delusions and scolded in reaction to auditory hallucinations. Physically she showed senile involution. Upon the wards she was usually contented to sit quietly in one place unless spoken to, when she would become irritable and would scold. She exhibited poorly systematized delusions of persecution. She was completely disoriented and gave fictitious names to the people about her. She conversed only in German. It was difficult to test her memory but there was an apparent memory defect which she filled in to some extent by fabrications. Her judgment was very defective.

After a residence in the hospital for 7 years during which time mental and physical deterioration were progressive, she died from chronic interstitial nephritis and mitral insufficiency.

Autopsy Abstract.—Brain 1150 grams. Chronic pachymeningitis, chronic leptomeningitis, marked atheroma of all cerebral vessels, convolutions generally atrophic, most marked atrophy in frontal lobes; right heart dilated, hypertrophy of myocardium in wall of left ventricle, chronic endocarditis, mitral insufficiency; advanced atheroma of aorta and peripheral vessels; cholelithiasis; chronic interstitial nephritis; chronic cystitis; chronic perisplenitis; uterus and ovaries atrophic.

CASE XXII.—J. D., No. 944, a painter, 74 years of age. There is no family or personal history until his commitment to Manhattan State Hospital in 1902 at the age of 64. His commitment paper states that the onset of his psychosis was gradual and that it began 15 years before, but this is questionable. Etiological factors given as adverse conditions, syphilis and intemperance. To the committing physicians he said that two

hoboes called him a filthy name 15 years ago and started a story about him. Ever since that time he had been hunted like a hound; everywhere he went he met people who knew this story; they followed him; they worked in covert ways. He evidently had hallucinations of hearing and was depressed and worried. He had "a stroke" with a right hemiplegia six weeks earlier and speech was still affected.

On admission to Manhattan State Hospital in 1902 he was old and decrepit and showed residuals of his paralysis. He was lame and saliva ran from his mouth; he spoke with difficulty. There was a history of syphilis but no physical signs. Intense conjunctivitis. He was wet and soiled.

Mentally, delusions of persecution were very prominent and he was depressed and very apprehensive. He reacted to hallucinations of hearing and sight. After a residence of five months in Manhattan State Hospital he was transferred to Central Islip State Hospital. On arrival there and during his residence he retained his systematized persecutory ideas; was depressed and apprehensive. His memory was poor but he had some appreciation of time and place. He reacted to hallucinations. Frequently he became profane and abusive. Admitted to the Binghamton State Hospital by transfer in 1907. His delusions were of a persecutory trend and he believed himself to be the greatest living poet. He had no insight but was fairly oriented. He deteriorated slowly; was untidy and uncleanly in his habits; frequently he was surly, profane and abusive. Chronic interstitial nephritis and chronic interstitial myocarditis caused his death.

Autopsy Abstract.—Brain 1160 grams; chronic pachymeningitis, edema of pia, general atheroma of cerebral vessels, convolutions generally atrophic, most marked atrophy in frontal, lateral ventricles somewhat dilated, large old softening in posterior limb of left internal capsule, small softening in middle of right optic thalamus; heart hypertrophied, chronic interstitial myocarditis, atheromatous coronaries, left ventricle dilated, chronic endocarditis, mitral insufficiency; advanced general atheroma of the whole arterial system; edema of lungs and scars in each apex; chronic interstitial nephritis.

CASE XXIII.—C. S., No. 946, farmer, 69 years of age. No family history obtained. He was admitted to the Binghamton State Hospital at the age of 47 with a psychosis of 13 years duration and was then classified as terminal dementia. This was the first attack. At the time of admission and during his residence in the hospital he was always reported as demented and delusional. His manner was agreeable and he was always contented with his surroundings. His delusions were of a grandiose nature and were firmly fixed. He believed himself to be God and Christ and to be in possession of millions of dollars. His memory, orientation and judgment were very defective but he worked regularly on one of the hospital farms and was considered trustworthy. At times he reacted to hallucinations claiming to see angels in the air. Aside from two attacks of

erysipelas his residence at the hospital was uneventful. Death finally resulted from chronic interstitial nephritis with profuse diarrhoea.

Autopsy Abstract.—Brain 1320 grams. Chronic leptomeningitis with injection of pial veins and edema, vessels contain non-girdling atheromatous patches, convolutions atrophic with widened sulci most marked in frontal lobes, fine granulations in third, fourth and lateral ventricles; heart hypertrophied, chronic endocarditis; advanced general arterio-sclerosis; intense congestion and edema of lungs with some small patches of broncho-pneumonia; chronic interstitial nephritis.

CASE XXIV.—E. S., No. 949, widow, aged 65 years. A paternal grandfather and a maternal aunt were insane (types of psychoses unknown). She enjoyed good health up to the time of the onset of her psychosis at the age of 57. She gradually lost her memory, became careless of her personal appearance, was unable to care for her ordinary needs and would become irritable when any attempt was made to correct her mistakes. Her mental deterioration was steadily progressive. She became untidy and at times uncleanly in her habits, was easily confused and amnesia became extreme. Some hallucinations of sight and hearing are mentioned but these were never prominent.

On admission to the hospital at the age of 62, a stout, elderly woman showing a slight amount of arterio-sclerosis presented. There was some edema of feet and ankles. Heart, lungs, abdomen, urine negative. Reflexes, cutaneous sensibilities and motor functions normal.

Mentally she was amnesic, completely disoriented and demented. She showed only transitory comprehension of questions asked her. Her manner was simple, childish and irresponsible but no delusions or hallucinations were elicited. Memory for both remote and immediate past were very imperfect and insight into her condition was wholly lacking.

During her residence in the hospital, about five years, her mental failure was extreme. Physical failure was slower. She developed pulmonary tuberculosis during the last year of her life and this finally caused her death.

Autopsy Abstract.—Brain 1110 grams. Chronic pachymeningitis, edema of pia and chronic leptomeningitis, moderate atheroma of vessels, lateral ventricles somewhat dilated, convolutions very atrophic especially in frontal, brain substance very soft, no focal softenings; general arterio-sclerosis; pulmonary tuberculosis with cavity formation and consolidation; chronic interstitial nephritis; chronic cystitis; mesenteric lymph nodes tubercular.

CASE XXV.—J. C., No. 950, a retired farmer, 70 years of age, whose father was intemperate and whose mother was insane a short time before her death at 72. His health was good until he was 66 years old when he suffered from "a stroke" of paralysis which affected the left side. About this time he lost considerable money in a bank failure. He partially recovered from his paralysis but showed considerable memory defect.

Two years later another "stroke" paralyzed the left side and mental deterioration was marked. He wandered away from his home, his memory defect became more marked, he became untidy and careless in his personal habits, was confused and at times restless and irritable, threatening members of his family. His conversation was rambling and incoherent.

On admission to the hospital a very weak and emaciated senile patient presented. His gait was unsteady and he showed residuals of a left hemiplegia. Marked arcus senilis and marked general arterio-sclerosis. Systolic murmur over apex of heart and moist rales over bases of lungs posteriorly.

Mentally he was confused, restless, very amnesic and completely disoriented. On account of the patient's great weakness a complete examination was impossible. During his short residence at the hospital he was in bed continuously. He was restless, confused, at times tried to leave his bed, muttered to himself in an unintelligible manner, was unable to enter into conversation on account of a mild delirium. He did not appreciate his surroundings and had no insight into his condition. He steadily grew weaker, developed broncho-pneumonia and died four days after admission.

Autopsy Abstract.—Brain 1260 grams. Chronic external pachymeningitis with slight internal hemorrhagic pachymeningitis over left convexity, pia edematous throughout and chronic leptomeningitis over frontals, centrals, Sylvian fissure and cisterna, some atheromatous yellow nodules in basilar and beginnings of cerebral arteries, convolutions atrophic in frontal, central and parietal regions, no softenings in cortex, marrow, capsules or basal nuclei; hypertrophy of heart, chronic endocarditis with some mitral stenosis; considerable atheroma of aorta and peripheral vessels; broncho-pneumonia, congestion and edema of lungs; chronic interstitial nephritis; chronic perisplenitis.

CASE XXVI.—E. H., No. 958, farm hand, 61 years of age. Unfortunately there is no family or early personal history of this patient. He was an inmate of an almshouse for three months before the onset of his psychosis at 60. Apprehension gradually developed in reaction to hallucinations of hearing. He heard voices threatening his life and begged to be protected and hidden. He would run away and hide to escape his imaginary impending murder. At times he was very emotional.

On admission to the hospital a decrepit, bent old man showing considerable emaciation and senile atrophy presented. Gait slow and trepidant due to age and club feet, senile tremors of extremities, exaggerated deep reflexes, incoordination of finer movements; pupils irregular and unequal and react sluggishly to light; marked arterio-sclerosis.

Mentally a childish, mildly confused and amnesic old man with considerable anxiety and apprehension. His apprehension was a reaction to auditory hallucinations.

During his residence in the hospital he continued apprehensive and frequently asked for protection. He had some idea of his surroundings

and was fairly oriented as a rule, occasionally becoming confused. His memory was quite defective. Mental and physical deterioration were steadily progressive. A fractured hip and broncho-pneumonia caused his death.

Autopsy Abstract.—Brain 1280 grams. Moderate chronic external pachymeningitis, atheroma of basilar and cerebral arteries, convolutions atrophic most marked in frontal region, no softenings; healed tubercles in apices of lungs, broncho-pneumonia, intense congestion and edema of lower lobes; fatty liver; chronic interstitial nephritis.

CASE XXVII.—H. G., No. 967, an inmate of a Woman's Relief Corps Home, aged 76 years. A mother and a sister were insane (types of psychoses unknown) and another sister was inferior. There was no accurate family or personal history; before her admission to the Home when she was 73 years old. It was then noticed that she talked and acted irrationally. The onset was gradual and the cause was given as age and heredity. She wandered aimlessly about at night, sometimes entering the rooms of other inmates of the Home and attempting to get into bed with them. She became agitated and sought protection from people who were conspiring against her.

On admission to the hospital, six weeks after the alleged onset, an elderly woman showing the usual signs of senility presented. General arterio-sclerosis, arcus senilis; feet and ankles edematous; systolic mitral murmur; albumin but no casts in the urine; knee jerks absent, superficial reflexes diminished; complete prolapse of uterus.

Mentally she was quiet and orderly, exhibited some persecutory delusions, was poorly oriented for time; showed a marked memory defect and reacted to aural hallucinations.

During her residence in the hospital ($3\frac{1}{2}$ years) she retained her persecutory ideas; they were vague and were not directed against particular persons but at times caused her to become emotional and much agitated. She deteriorated steadily in her mental and physical condition. She was in bed more than a year before her death on account of general weakness. Ten days before death a series of convulsions involved the left side and finally left it paralyzed.

Autopsy Abstract.—Brain 1240 grams. Skull greatly thickened by a chronic pachymeningitis, chronic leptomenigitis, some edema of pia, considerable atheroma of arteries, convolutions atrophic especially frontal, left central and parietal areas, lacunar softenings in right and left lenticular nuclei and in both internal capsules, a large acute softening in white marrow cutting off optic radiation just outside and behind right lateral ventricle; heart hypertrophied, chronic endocarditis; advanced general atheroma of arteries; chronic interstitial nephritis; purulent cystitis; red infarcts in lungs; gall stones and chronic cholecystitis; infarct in spleen; ovaries cystic; uterus prolapsed and contained many small fibroids.

CASE XXVIII.—G. B., No. 968, farmer, 62 years of age. There is no family or personal history previous to admission to the Binghamton State

Hospital at the age of 41. At this time he was in rather poor physical condition with some physical signs of pulmonary tuberculosis. His mental condition was then given as one of terminal dementia. He was untidy in his habits. During his residence in the hospital his mental deterioration was steadily progressive and finally became extreme; he vegetated. At irregular intervals he would become excited and noisy, talked incoherently and was very profane. Occasionally he assaulted impulsively. Several notes state that he believed himself to be the Lord, he had various religious delusions and there seemed to be a distinct sexual trend in his ideas. During most of the latter years of his life he was dull, stupid and indifferent, and was untidy in his habits. There were several exacerbations of his pulmonary tuberculosis, each leaving him in poorer physical condition. He finally died of pulmonary tuberculosis after a hospital residence of 21 years.

Autopsy Abstract.—Brain 1240 grams. Dura thickened, chronic leptomeningitis along longitudinal fissure, brain arteries normal, convolutions generally atrophic, most marked atrophy in frontal and motor areas, no softenings; cardiac dilatation, chronic endocarditis, mitral insufficiency; general arterio-sclerosis except brain; pulmonary tuberculosis; chronic interstitial nephritis; tubercular entero-colitis; tubercular mesenteric glands.

CASE XXIX.—J. D., No. 973, farm laborer, 62 years of age. One sister is insane (type of psychosis unknown). He used alcohol and tobacco to excess, often becoming intoxicated. When 25 years of age he received a stab wound in the back just to the right of the mid-dorsal column. There was no paralysis immediately following. There is a history of rheumatism which necessitated the use of crutches for locomotion for six years after 52. At 58 unable to walk at all. Early in his 60th year he became sullen, refused to converse and at times refused to eat. He had a delusion that a brother attempted to poison him. Then he began to react actively to hallucinations of sight and hearing; he shook his fists, tore the bedclothing, screamed at the top of his voice and threatened suicide. There was no history of syphilis or of paralysis.

On admission to the hospital he presented a spastic paraplegia with muscular atrophy of both legs and contractures. The knee joints were enlarged and contained fluid. Superficial reflexes were diminished, deep slightly exaggerated, and organic controlled. Ankle clonus was present, no Babinski. Pupils normal. Speech normal. Numbness and diminution of pain sense in legs. Heat and cold sense also disturbed. The duration of this condition could not be ascertained. Some arcus senilis and moderate arterio-sclerosis. Heart, lungs and abdomen negative.

Mentally he was quiet and orderly; remained in bed with the clothes over his head and became very irritable and sarcastic when disturbed. He frequently pointed to the ceiling and muttered to himself. When he would reply to questions, which was seldom, his answers were coherent, desultory and slightly retarded. He was easily confused and showed some

deterioration. Disorientation for time and grasp on recent past was poor. He exhibited considerable restlessness and reacted to visual and aural hallucinations. He was untidy and uncleanly.

He gradually became extremely deteriorated mentally. Throughout his residence in the hospital he reacted actively to hallucinations of sight and hearing. He became much reduced physically during the last years of his life and an intercurrent broncho-pneumonia caused his death.

Autopsy Abstract.—Brain 1420 grams. Chronic pachymeningitis, chronic leptomenigitis, atheromatous patches in cerebral vessels, convolutions somewhat atrophic with widened sulci; heart dilated, chronic endocarditis, patent foremen ovale; general atheroma of arterial system; broncho-pneumonia; chronic interstitial nephritis; infarct of spleen. No autopsy of the spinal cord.

CASE XXX.—F. R. H., No. 976, a domestic, 64 years of age. This patient was admitted to the Binghamton State Hospital in 1882, at which time she was 34 years of age. This was her first attack but was said to have had a duration of 15 years. The cause of her insanity is given as cessation of menstruation and heredity; it being stated that her paternal grandfather was insane. Her commitment paper stated that she was excitable, suicidal and homicidal, and was given to sudden passions.

Physically, on admission, she was in good condition. Mentally, she was quiet and orderly, neat and tidy. During her residence of 30 years in the hospital at times she would become excited and pounded and hit herself but never caused any serious injury. She would stand in one place for hours without moving; at other times she was restless and very resistive and profane and obscene. She apparently reacted to hallucinations of hearing. Her memory was poor. Her mental deterioration progressed slowly but steadily.

Thirteen days before her death she developed a diarrhoea which responded to treatment. Two days before death she had a general convulsion. She became unconscious and there was a paralysis of both arms and legs, reflexes were absent. Urine contained hyalin and granular casts and albumin. The right cheek puffed at each expiration. Blood pressure 130. Shortly before death the left pupil was slightly larger than the right.

Autopsy Abstract.—Brain 1320 grams. Chronic pachymeningitis, free blood in subdural space on left side over motor cortex, the left anterior and posterior centrals, paracentral and superior parietal convolutions and the underlying marrow are almost completely destroyed by a large hemorrhage with both lateral ventricles full of clotted blood which had broken through the left internal capsule and basal nuclei, all convolutions were flattened, vessels contained many girdling and non-girdling yellow plaques; chronic endocarditis, left ventricle dilated; advanced general atheroma of the arteries; small patch of broncho-pneumonia in right lung; chronic interstitial nephritis.

CASE XXXI.—E. M. M., No. 982, widow, 83 years of age. Family history negative for nervous or mental diseases. She had always been

Hospital at the age of 41. At this time he was in rather poor physical condition with some physical signs of pulmonary tuberculosis. His mental condition was then given as one of terminal dementia. He was untidy in his habits. During his residence in the hospital his mental deterioration was steadily progressive and finally became extreme; he vegetated. At irregular intervals he would become excited and noisy, talked incoherently and was very profane. Occasionally he assaulted impulsively. Several notes state that he believed himself to be the Lord, he had various religious delusions and there seemed to be a distinct sexual trend in his ideas. During most of the latter years of his life he was dull, stupid and indifferent, and was untidy in his habits. There were several exacerbations of his pulmonary tuberculosis, each leaving him in poorer physical condition. He finally died of pulmonary tuberculosis after a hospital residence of 21 years.

Autopsy Abstract.—Brain 1240 grams. Dura thickened, chronic leptomeningitis along longitudinal fissure, brain arteries normal, convolutions generally atrophic, most marked atrophy in frontal and motor areas, no softenings; cardiac dilatation, chronic endocarditis, mitral insufficiency; general arterio-sclerosis except brain; pulmonary tuberculosis; chronic interstitial nephritis; tubercular entero-colitis; tubercular mesenteric glands.

CASE XXIX.—J. D., No. 973, farm laborer, 62 years of age. One sister is insane (type of psychosis unknown). He used alcohol and tobacco to excess, often becoming intoxicated. When 25 years of age he received a stab wound in the back just to the right of the mid-dorsal column. There was no paralysis immediately following. There is a history of rheumatism which necessitated the use of crutches for locomotion for six years after 52. At 58 unable to walk at all. Early in his 60th year he became sullen, refused to converse and at times refused to eat. He had a delusion that a brother attempted to poison him. Then he began to react actively to hallucinations of sight and hearing; he shook his fists, tore the bedclothing, screamed at the top of his voice and threatened suicide. There was no history of syphilis or of paralysis.

On admission to the hospital he presented a spastic paraplegia with muscular atrophy of both legs and contractures. The knee joints were enlarged and contained fluid. Superficial reflexes were diminished, deep slightly exaggerated, and organic controlled. Ankle clonus was present, no Babinski. Pupils normal. Speech normal. Numbness and diminution of pain sense in legs. Heat and cold sense also disturbed. The duration of this condition could not be ascertained. Some arcus senilis and moderate arterio-sclerosis. Heart, lungs and abdomen negative.

Mentally he was quiet and orderly; remained in bed with the clothes over his head and became very irritable and sarcastic when disturbed. He frequently pointed to the ceiling and muttered to himself. When he would reply to questions, which was seldom, his answers were coherent, desultory and slightly retarded. He was easily confused and showed some

deterioration. Disorientation for time and grasp on recent past was poor. He exhibited considerable restlessness and reacted to visual and aural hallucinations. He was untidy and uncleanly.

He gradually became extremely deteriorated mentally. Throughout his residence in the hospital he reacted actively to hallucinations of sight and hearing. He became much reduced physically during the last years of his life and an intercurrent broncho-pneumonia caused his death.

Autopsy Abstract.—Brain 1420 grams. Chronic pachymeningitis, chronic leptomenigitis, atheromatous patches in cerebral vessels, convolutions somewhat atrophic with widened sulci; heart dilated, chronic endocarditis, patent foremen ovale; general atheroma of arterial system; broncho-pneumonia; chronic interstitial nephritis; infarct of spleen. No autopsy of the spinal cord.

CASE XXX.—F. R. H., No. 976, a domestic, 64 years of age. This patient was admitted to the Binghamton State Hospital in 1882, at which time she was 34 years of age. This was her first attack but was said to have had a duration of 15 years. The cause of her insanity is given as cessation of menstruation and heredity; it being stated that her paternal grandfather was insane. Her commitment paper stated that she was excitable, suicidal and homicidal, and was given to sudden passions.

Physically, on admission, she was in good condition. Mentally, she was quiet and orderly, neat and tidy. During her residence of 30 years in the hospital at times she would become excited and pounded and hit herself but never caused any serious injury. She would stand in one place for hours without moving; at other times she was restless and very resistive and profane and obscene. She apparently reacted to hallucinations of hearing. Her memory was poor. Her mental deterioration progressed slowly but steadily.

Thirteen days before her death she developed a diarrhoea which responded to treatment. Two days before death she had a general convulsion. She became unconscious and there was a paralysis of both arms and legs, reflexes were absent. Urine contained hyalin and granular casts and albumin. The right cheek puffed at each expiration. Blood pressure 130. Shortly before death the left pupil was slightly larger than the right.

Autopsy Abstract.—Brain 1320 grams. Chronic pachymeningitis, free blood in subdural space on left side over motor cortex, the left anterior and posterior centrals, paracentral and superior parietal convolutions and the underlying marrow are almost completely destroyed by a large hemorrhage with both lateral ventricles full of clotted blood which had broken through the left internal capsule and basal nuclei, all convolutions were flattened, vessels contained many girdling and non-girdling yellow plaques; chronic endocarditis, left ventricle dilated; advanced general atheroma of the arteries; small patch of broncho-pneumonia in right lung; chronic interstitial nephritis.

CASE XXXI.—E. M. M., No. 982, widow, 83 years of age. Family history negative for nervous or mental diseases. She had always been

well until the onset of her psychosis at the age of 74. The death of a son at that time was apparently an important etiological factor. She gradually became despondent and took less interest in her own life. At the age of 81 there is a history of cerebral insult which caused a transient paresis of her left leg. Her mental condition then began to deteriorate very rapidly. She became unable to perform her household duties; was irritable and obstinate; endangered the lives of those in her home by turning on the gas without lighting it; and her memory and judgment were very defective.

On admission to the hospital a well-developed rather feeble old lady presented. Heart, lungs and abdomen negative. Reflexes normal. General arterio-sclerosis.

Mentally she was completely disoriented, easily became confused and fatigued. Her memory was very poor for both recent and remote events. Her judgment was defective.

During her residence in the hospital (1 year 9 months) mental and physical deterioration were steadily progressive. She became very childish and her memory and judgment became nil. An epithelioma developed on her vulva. Acute cystitis caused her death.

Autopsy Abstract.—Brain 1200 grams. Chronic leptomeningitis, considerable atheroma of cerebral arteries, moderate atrophy of convolutions, an acute softening of white marrow of the right occipital lobe behind the lateral ventricle cutting off the optic radiation; heart hypertrophied, chronic endocarditis, mitral insufficiency; general advanced atheroma of arterial system; red infarct of left lung; acute hemorrhagic cystitis.

CASE XXXII.—J. H., No. 986, laborer, 61 years of age. Family history negative for nervous and mental disease. He is said to have had fits at the age of three or four years. During his life he was a wanderer and never retained a position for any length of time. Was reticent, dreamy, peculiar, odd and preferred to be alone. He became a tramp. At the age of 61 he became morose and refused to work. At times he refused food and was suspicious of those about him. This condition developed in few weeks.

On admission to the hospital he was ill nourished and poorly developed and his motor activities were at a low ebb. Heart hypertrophied, systolic murmur in aortic area; general arterio-sclerosis; lungs and abdomen negative; reflexes normal; fine tremor of fingers; cutaneous sensibilities somewhat blunted but no complete anesthesia.

Mentally he was depressed and apprehensive and would not talk. He was resistive and seemed to expect some personal attack.

During his residence in the hospital (4 months) he was extremely depressed and was very suspicious of those about him. He showed great agitation, moving about the ward restlessly, at times moaning and resisting violently any attempt to approach him or to administer to his needs. He refused food and had to be tube-fed. He repeated over and over "Oh, my

God" but would answer no questions. He lost flesh and strength rapidly and died suddenly of acute cardiac dilatation.

Autopsy Abstract.—Brain 1360 grams. Pia slightly thickened along longitudinal fissure, vessels normal, fine granulations in roof of fourth ventricle, none in lateral, no softenings or atrophies; heart hypertrophied, both sides of heart dilated, chronic endocarditis; atheroma of aorta and most of peripheral vessels; lungs congested and edematous.

CASE XXXIII.—D. B. C., No. 989, farmer, aged 62 years. There is no family history of nervous or mental disease. Friends stated that he had always been looked upon as an unfortunate, weak-minded boy and man. Since maturity he had used alcohol to excess and was intoxicated by small amounts. At the age of 50 after protracted alcoholism, he became violent, threatened the lives of his friends, claimed to have farms, horses, etc; stated that he had a wife and children when he had never been married. He recognized strangers as old friends.

On admission to the hospital in 1901, one week after the onset, he was in good physical condition. Mentally he was cheerful, talkative, incoherent; had a very poor memory and laughed continually in a foolish manner. His manner was that of an imbecile.

During his residence in the hospital (12 years) his condition was that of an imbecile. He had occasional excited periods when he would make assaults and destroy clothing and furniture. Most of the time he was childish, quiet and untidy. During the last few years of his life he presented a rather typical picture of senile dilapidation. An infection of his urinary tract finally caused his death.

Autopsy Abstract.—Brain 1350 grams. Chronic pachymeningitis, chronic leptomeningitis, edema of pia, atheroma of cerebral vessels, general atrophy of convolutions, most marked in frontal; hypertrophy of heart, chronic endocarditis, mitral insufficiency; general atheroma of arterial system; purulent bronchitis, congestion and edema of lungs; chronic interstitial nephritis; acute pyelitis; acute cystitis.

CASE XXXIV.—J. V. A., No. 990, female, aged 67 years. No family history of nervous or mental diseases except one paternal uncle who was an epileptic. She is said to have enjoyed good health until the onset of her psychosis at the age of 64. She then began to be very forgetful and at times was agitated and irritable. Her mental deterioration was steadily progressive. She took no care of her person, became more irritable and made threats to injure those about her with a knife; her conversation became incoherent and she reacted to hallucinations of sight.

On admission to the hospital at 67 she showed well-advanced senile changes. Considerable arterio-sclerosis, blood pressure 140; reflexes normal; heart, lungs and abdomen negative. Examination unsatisfactory because of agitation and resistiveness of patient.

Mentally she was confused, restless, very amnesic, irritable and talked in a rambling and disconnected manner. She was completely disoriented;

her memory was defective for both recent and remote events and she had no insight into her condition.

During her residence in the hospital (3 months) her mental condition remained much the same as on admission. She wandered about by day and by night, picking at the clothing of other patients and pulling bed-clothing from beds. Her answers to questions were always irrelevant. She was confused, agitated, depressed and completely disoriented. Physical failure was rather rapid. After several attacks of syncope she died from mitral insufficiency.

Autopsy Abstract.—Brain 1160 grams. Chronic pachymeningitis, pia edematous, vessels apparently normal, convolutions generally atrophic, most marked atrophy in frontal, motor and parietal cortex; mitral valves incompetent; moderate general arterio-sclerosis; some edema of the lungs; chronic interstitial nephritis.

CASE XXXV.—E. D. P., No. 995, a retired policeman, 78 years of age. Two maternal cousins committed suicide. There is no other family history of nervous or mental disease. He had always enjoyed good health until the onset of his psychosis at the age of 75. He became dazed and bewildered; had an idea that his house was full of people who were persecuting him and claimed that he had been hypnotized. He threatened suicide. The onset was gradual and the psychosis progressed steadily until he became so much deteriorated that he was completely disoriented and would get lost in familiar surroundings.

On admission to the hospital at the age of 76 he appeared senile. General arterio-sclerosis, arcus senilis; pupillary superficial and deep reflexes normal; heart, lungs and abdomen normal; chronic cystitis.

Mentally he was mildly elated, simple and childish. His memory for recent and distant events was somewhat impaired and he filled in the deficiencies at times by fabrications. There were some vague persecutory delusions; orientation was poor for place and he had no insight.

During his residence at the hospital (2 years) his mental and physical conditions progressively deteriorated. Amnesia and disorientation became complete. He became untidy and uncleanly in his habits.

Autopsy Abstract.—Brain 1220 grams. Chronic pachymeningitis, chronic leptomenigitis, considerable atheroma of cerebral vessels, convolutions much atrophied most marked in frontal, upper parietal and occipital convolutions, brown softening in middle of left lenticular nucleus; hypertrophy of heart, chronic endocarditis, mitral insufficiency; advanced atheroma of whole arterial system; broncho-pneumonia; chronic interstitial nephritis; chronic cystitis; chronic perisplenitis.

CASE XXXVI.—H. L., No. 996, teacher, aged 73 years. The only history of nervous or mental disease in her family is of a paternal uncle who was insane, type of psychosis unknown. She had a collegiate training and taught French and music. At 58 she was compelled to give up teaching on account of increasing deafness. This deafness is believed to be one of the

etiological factors in the development of her psychosis. There is no history of serious illness until a complete hysterectomy for a large fibroid at 62. While in the general hospital she had persecutory ideas directed against some of the nurses and after her return to her home she became difficult to manage and control. About three months later she was admitted to an Old Ladies' Home as an inmate. Here she gradually developed persecutory delusions and ideas of reference and became excited and depressed and threatened suicide.

On admission to the hospital in 1903 at the age of 63, she was emaciated, blind in one eye, very deaf, some arterio-sclerosis, tremor of tongue, reflexes diminished.

Mentally she was quiet and orderly, much depressed and talked freely of the conspiracy against her.

During her residence in the hospital she was always apprehensive, expressing belief that there was a conspiracy to persecute her. She was very restless, walking about and asking those about her numerous questions as to what was to become of her, etc. She frequently stated that the food was poisoned. At times she was violent and assaulted the nurses and patients impulsively. She was childish, faultfinding and unreasonable in her demands. She gradually became resistive, disoriented, amnesic and generally much deteriorated. She was in poor physical condition throughout. She was found dead in bed one morning after having been seen several times during the night in comfortable condition.

Autopsy Abstract.—Brain 1230 grams. Chronic pachymeningitis, edema of pia, small patches of atheroma at origin of cerebral arteries, convolutions generally atrophic, two lacunar softenings in middle of right optic thalamus; heart hypertrophied, dilatation of mitral ring, chronic endocarditis, mitral insufficiency, both sides of heart dilated; general arterio-sclerosis; chronic interstitial nephritis.

Analysis of the 36 plaque cases places at least 28, or over 77 per cent of them, in the senile psychosis group. In five of the senile cases there was a suggestion of the presbyophrenia symptom complex, but in no case could the psychosis be labelled pure presbyophrenia. Four cases, XI, XXIII, XXVIII and XXX were of the dementia præcox type living to the seventh decade and showing many senile characteristics. In cases XXIX and XXXIII alcohol was undoubtedly a prominent etiological factor. They showed many senile characteristics, especially case XXXIII, whose last few years were passed as a typical senile dilapidation. He was also inferior. Case XIX was an agitated depression which may have been involution melancholia or an agitated depression type of senile psychosis, diagnosis being uncertain on account of

the very poor history and the difficulty of making any mental examination.

Cases XII, XIII, XXIV and XXXIV were diagnosed clinically senile psychoses, but were atypical. In addition to miliary plaques the sections of these four cases showed the intracellular neurofibril alterations of Alzheimer. Case XII, a female, developed a psychosis at 49. She became depressed and suicidal, was confused and disoriented, had very poor memory and retention, and insight and judgment were defective. Physically she showed over-active reflexes, coarse jerky tremors of tongue, unequal pupils which reacted well and peripheral arterio-sclerosis. Age at death, 53 years. Case XIII, female, developed a psychosis at 57. She gradually became confused, disoriented and her memory and retention became very defective. She had hallucinations of sight and hearing. Physically she complained of headaches and vertigo; there was a coarse tremor of the hands, unsteady gait and incoordinated movements; exaggerated reflexes; mitral heart lesion; moderate arterio-sclerosis. Age at death, 62 years. Case XXIV, a female, whose psychosis developed at 57. She gradually became confused and disoriented and her memory became very defective. She had hallucinations of sight and hearing. Judgment and insight were nil. Physically she showed some arterio-sclerosis; reflexes, cutaneous sensibilities and motor functions were normal. Age at death, 65 years. Case XXXIV, female, developed her psychosis at 64. She became very forgetful; was confused, irritable, disoriented and was absolutely lacking in judgment and insight. She reacted to hallucinations of sight. Physically she had considerable arterio-sclerosis. Her reflexes and motor functions were normal. Age at death, 67. These four cases stand out in rather marked contrast from the other plaque cases. They were the only ones demonstrating the intracellular neurofibril alterations. The onset of the psychosis in each case, with the possible exception of Case XXXIV, was in the presenile period and the deterioration was extreme. Confusion and disorientation characterized each case and three had hallucinations. Two had well developed physical signs of organic brain lesions. Aphasic symptoms and ideational apraxia were lacking in all cases. All of the cases were females.

Of the 58 elderly cases whose brains failed to demonstrate plaques, 12 were diagnosed clinically senile psychosis. The clinical abstracts and the autopsy abstracts of these 12 cases are here added.

ABSTRACTS OF CLINICAL HISTORIES AND AUTOPSY FINDINGS IN SENILE PSYCHOSES WITHOUT PLAQUES.

CASE XXXVII.—P. F., No. 555, farmer, 60 years of age, heavy drinker. One aunt was insane and one brother committed suicide during an attack of grippe. He enjoyed good health until his 59th year when his psychosis developed. The onset was gradual. His conversation became rambling; he could not sleep at night and became very delusional, most of his delusions having reference to travel; was depressed at times and at other times was active and violent. Confusion and disorientation became prominent.

On admission to the hospital a poorly nourished elderly man presented. Signs of infiltration of the right upper lobe of lung; mitral regurgitation; edema of ankles; marked arterio-sclerosis; extreme internal strabismus; reflexes normal; no tremors; no speech defects; gait somewhat trepidant.

Mentally he was restless, agitated and noisy; untidy and destructive of his clothing; made many useless and senseless gestures offering many and different explanations for the same; replied freely to questions and his replies were coherent but inaccurate; at times he fabricated. There was some flight of ideas; delusions expansive and persecutory in nature; reaction to visual and aural hallucinations; part of the time he was completely disoriented and then again he was partly oriented; grasp on remote and recent past was impaired; retention defective; insight only partial.

During his one year and four months residence in the hospital he presented essentially the same picture as on admission except that he became more confused and demented. He was noisy and restless especially at night. His physical health failed steadily. He became feeble, was unsteady on his feet and his temperature became subnormal.

Autopsy Abstract.—Brain 1540 grams. Dura not thickened not adherent, pia edematous, somewhat thickened and opaque over upper central convolutions with many Pacchionian granulations, vessels show advanced arterio-sclerosis throughout, convolutions somewhat atrophic with widened sulci in frontal and occipital lobes, no focal softenings in cortex, marrow or basal nuclei, brain substance soft; chronic endocarditis; general arterio-sclerosis; liver, kidneys and spleen much congested.

CASE XXXVIII.—A. K., No. 851, a retired school teacher, 85 years of age. One grandfather was alcoholic and one brother committed suicide at 45 years of age during a depression over family troubles. There is said to have been some insanity on the maternal side but this information is not confirmed. At the age of 31 he had an attack of "nervous prostration," aside from which his entire life has been normal up to the onset of his

psychosis at the age of 68, at which time he became depressed and threatened suicide. This depression improved somewhat but he never regained his mental equilibrium. He gradually became untidy and filthy in his habits; built fires at night; wandered about at night shouting and disturbing neighbors; threatened to kill neighbors. He was first committed to the Binghamton State Hospital at the age of 80. At this time he was restless, talkative, at times confused, memory was defective for recent events, delusional, some delusions of a persecutory nature, others somatic and expansive, orientation fair. He gradually became quieter and was taken home after a hospital residence of 10 months. He retained his persecutory ideas. He did not get along well; was frequently involved in altercations about imagined business; was easily excited and made numerous threats; made himself so disagreeable that he was readmitted to the hospital at the age of 83.

At this admission a fairly preserved man showing the usual senile changes presented. Some impairment of hearing; pupils equal, irregular, especially right, react well; deep reflexes exaggerated, considerable tremor of fingers; had frequent attacks of vertigo for many years; pulse high tension, vessels stiff and tortuous, arcus senilis; varicose veins.

Mentally he was excited, voluble, elated and very delusional, his delusions being expansive, religious and persecutory directed against his children and neighbors. Conversation was somewhat rambling and disconnected; memory was good for recent and remote events; orientation good; no insight; retention good.

During his two years residence in the hospital he showed a slowly progressive deterioration. At times he was emotionally elated; later he became faultfinding, profane and obscene. He became filthy in his habits; restless and noisy at night. His memory became impaired. Three months before his death he developed a cellulitis of the left leg which was the cause of his death.

Autopsy Abstract.—Brain 1500 grams. Dura thickened, injected and adherent to calvarium, pia edematous, thickened, opaque over vessels and sulci, congestion over right anterior central, frontal, temporal and left occipital areas, Pacchionian granulations along longitudinal fissure, vessels very much thickened, stiff and tortuous throughout, convolutions much atrophied and sulci widened throughout, marked in motor and frontal areas, brain large and firm and well marked; chronic endocarditis, mitral insufficiency; advanced atheroma of aorta and peripheral vessels; internal and external iliacs on left side greatly dilated and contain thrombus; congestion, edema, a slight broncho-pneumonia in lower lobes of lungs; passive congestion of liver and spleen; chronic parenchymatous nephritis.

CASE XXXIX.—J. H., No. 860, a farmer, 77 years of age, negative family history for nervous and mental disease. He enjoyed good health until his 77th year. The onset of his psychosis dates from this time. It was fairly rapid in development. He became restless; wandered away from home and was unable to find his way back; assaulted his wife and

threatened suicide. Three months after the onset it was necessary to commit him to the hospital.

On admission to the hospital a poorly nourished man; deformity and shortening of left leg due to an old fracture; arcus senilis; exaggerated knee jerks; tremor; marked arterio-sclerosis; irregular pulse; gait feeble.

Mentally he was confused, appeared somewhat depressed and anxious; delusions of persecution, that his children wanted to get rid of him so that they might get his property and to accomplish this they arranged to poison him; oriented except for time; memory fair for remote past but poor for immediate past; some insight.

He failed steadily physically and mentally during his 10 months residence in the hospital. His confusion became more marked, memory failed, disorientation became complete. For a time he was resistive and it was necessary to feed him. One month before his death general weakness confined him to his bed. Bed sores developed and later a dry gangrene appeared and spread on the left great toe and over the dorsum of the left foot.

Autopsy Abstract.—Brain 1300 grams. Dura thickened and adherent to skull, pia thickened, vessels generally thickened, nodular and have many yellow plaques, convolutions atrophied and sulci widened especially in frontal and occipital lobes, no softenings, brain substance all soft; chronic endocarditis, calcareous deposits in mitral valves; advanced atheroma of aorta and peripheral vessels; chronic interstitial nephritis; liver and spleen congested.

CASE XL.—J. P., No. 872, a farmer, 71 years of age, whose mother died insane (senile psychosis) at the Binghamton State Hospital. There is nothing else of interest in the family or personal history. He was an inmate of a county house when his psychosis developed at the age of 66. He became despondent; slept little at night; talked at night; attempted to run away; had hallucinations of hearing and reacted to them; delusions of persecution in regard to property.

On admission to the hospital at the age of 67 a poorly nourished man; hearing and vision defective; gait unsteady, station poor, tremor of hands and tongue; patellar reflexes exaggerated; pupils normal; arcus senilis, general arterio-sclerosis.

Mentally, he answered questions after urging; appeared suspicious; showed no insight into his mental condition; had hallucinations of hearing; was easily confused and showed marked memory impairment for recent events, although memory was quite good for remote past.

His dementia increased steadily, memory impairment advancing, disorientation; he became irritable, faultfinding, suspicious, uncommunicative, seclusive and reacted to hallucinations of hearing. Six months before death he had a slight seizure causing temporary paresis for 48 hours. During the last two days of his life he was exceedingly drowsy.

Autopsy Abstracts.—Brain 1190 grams. Dura adherent to calvarium, pia opaque and thickened over sulci, some edema over frontal tips, all vessels

have many yellow plaques, frontal convolutions and left calcarine area atrophic, brain substance soft, lacunar softenings in left lenticular nucleus, left optic thalamus and anterior limb of internal capsule, and in right optic thalamus; chronic endocarditis, mitral stenosis; advanced atheroma of aorta and peripheral vessels; chronic purulent bronchitis.

CASE XLI.—J. M., No. 901, cigarmaker, 83 years of age. There is no family history or early personal history. At the age of 72 he developed delusions of a persecutory nature in reaction to hallucinations of hearing. He became restless and noisy at night shouting and screaming, saying that young men came to seek his daughter. He was admitted to Manhattan State Hospital where he was noted as depressed and demented. He could not tell the day of the month or the year. After about a year he was transferred to the Central Islip State Hospital where his notes state that he had persecutory ideas and reacted actively to hallucinations of sight and hearing. He was disoriented, had deficient memory and was lacking in judgment and insight. Occasionally he was restless and excited. Transferred to the Binghamton State Hospital at the age of 79. During his residence in the latter hospital his mental condition was essentially as described at the other hospitals. He deteriorated slowly. He was always noted as being in fair physical condition. He died after a short illness resulting from carbuncle of the neck.

Autopsy Abstract.—Brain 1440 grams. Chronic pachymeningitis, chronic leptomenigitis, cerebral arterio-sclerosis, marked atrophy of frontal and central convolutions; chronic endocarditis; atheroma of arterial system; chronic interstitial nephritis; large carbuncle of neck involving skin and deep fascia.

CASE XLII.—C. B., No. 926, old soldier, 71 years of age. He went to the Soldiers and Sailors' Home at Bath, N. Y., when he was 66 years of age. For some months prior to his admission to the Home he had shown memory defects and mental confusion. In the Home he had no idea of his surroundings, was dull and stupid most of the time but occasionally had periods of violent and dangerous excitement. After two years in the Home it was necessary to commit him to the Long Island State Hospital. Notes made there state that he showed marked memory defect for both recent and remote occurrences, had no insight, and made numerous discrepancies in his statements. He remained in bed during most of his residence there. If disturbed he became noisy and abusive. Transferred to the Binghamton State Hospital at the age of 70. Physically he was poorly nourished; tremor of facial muscles and hands; general arterio-sclerosis; heart, lungs and abdomen negative. Mentally he showed complete disorientation, memory very deficient, judgment and insight lacking. He was very resistive and easily irritated. He remained in practically the same condition until his death, which resulted from abscess of the lung and bronchopneumonia.

Autopsy Abstract.—Brain 1250 grams. Chronic leptomenigitis, edema of pia, cerebral arterio-sclerosis, atrophy of convolutions, lateral ventricles

dilated; general arterio-sclerosis and atheroma; abscess of left lung and broncho-pneumonia; fatty liver, cholelithiasis; chronic interstitial nephritis.

CASE XLIII.—R. G. C., No. 933, farmer, 72 years of age. One brother was insane for a short time following a heat stroke. There is no history of illness previous to the onset of his psychosis except some retention of urine due to enlarged prostate. In his 72d year he wrote to his son that he was about to be married and told of inheriting great wealth. He became greatly excited over trivial matters and finally became violent.

On admission to the hospital a poorly nourished old man presented. He had marked arcus senilis, general arterio-sclerosis, blood pressure 144, physical signs of pulmonary tuberculosis. His heart and abdomen were negative. Motor functions negative.

Mentally his retention was very defective, memory for remote and immediate past was very poor. He was disoriented, irritable and confused; expressed a vague paranoid trend and some ideas of affluence. His appearance was slovenly and he wet and soiled his clothing. During his five months residence in the hospital his mental condition did not change materially. He became less wet and soiled. Occasionally he was irritable but usually he was childishly happy. Lobar pneumonia caused his death.

Autopsy Abstract.—Brain 1360 grams. Chronic internal pachymeningitis hemorrhagica, chronic leptomeningitis, edema of pia, cerebral arterio-sclerosis, convolutions slightly atrophic; hypertrophy of heart, chronic endocarditis, mitral insufficiency; general arterio-sclerosis; lobar pneumonia, some caseous patches in right upper lobe; chronic interstitial nephritis.

CASE XLIV.—L. B., No. 934, retired teacher, aged 72 years. Since girlhood she was whimsical and eccentric regarding certain articles of diet. Good health until her 60th year when it was necessary for her to discontinue her teaching on account of physical and mental breakdown. After a partial recovery she lived with a friend; kept the house and prepared their meals for which she was given her meals. She domineered and influenced her benefactress who was blind. Gradually she developed persecutory ideas directed against neighbors in reaction to what were probably auditory hallucinations. She put cotton in her ears to prevent hearing the remarks made about her. Often she became abusive in the house and on her porch. She would allow no one in the house and neglected to care for her invalid friend. Her ideas in regard to food became more absurd and often she starved herself rather than eat meat or butter or any article containing them.

On admission to the hospital a poorly nourished old lady, aged 70 years presented. She had a cataract in the left eye; pupillary and superficial reflexes normal, deep reflexes exaggerated; some arterio-sclerosis; heart, lungs and abdomen negative.

Mentally she expressed many persecutory delusions; was well oriented; memory was impaired for dates in remote past but was good for events, poor for time in recent past; judgment poor and insight lacking.

During her two years residence in the hospital she retained her persecutory delusions. At first she refused to eat meat, butter or milk believing they were contaminated. She gradually became untidy and uncleanly in her habits; was faultfinding and irritable and gradually deteriorated. Physical failure was steadily progressive. A failing myocardium caused her death.

Autopsy Abstract.—Brain 1250 grams. Chronic leptomeningitis, edema of pia, slight atheroma of cerebral arteries, convolutions slightly atrophic; fatty infiltration of myocardium, right heart dilated; considerable atheroma of general arterial system; congestion and edema of lungs; chronic interstitial nephritis.

CASE XLV.—A. V. T., No. 978, farmer, aged 64 years. His father was alcoholic and was insane for a short time before his death at 63. The patient had always enjoyed good health until the onset of his psychosis in his 64th year. He began to use very bad judgment in business transactions. His temper became very quick and he was frequently threatening and ugly. At night he was restless and noisy. He finally threatened to shoot members of his family and neighbors and had to be committed four weeks after the onset.

On admission to the hospital an old man showing arcus senilis, advanced general arterio-sclerosis, cardiac hypertrophy and a loud mitral systolic murmur, blood pressure 164.

Mentally he showed a paranoid trend directed against relatives; his judgment was very poor; insight lacking; memory for recent events very much impaired and memory poor for dates of remote events; well oriented; retention poor.

During his residence in the hospital his mental condition did not change materially. He died suddenly, about a year after admission, from acute cardiac dilatation.

Autopsy Abstract.—Brain 1480 grams. Chronic pachymeningitis, edema of pia, vessels normal in brain, convolutions atrophic with widened sulci in frontal and central areas; hypertrophy of heart, both sides of heart much dilated, chronic endocarditis, mitral insufficiency; advanced atheroma of aorta and peripheral vessels; chronic interstitial nephritis.

CASE XLVI.—L. C., No. 979, wife of farmer, aged 71 years. The psychosis developed in her 67th year. The onset was gradual. She became forgetful; often wandered away from home, not being able to find her way back; suffered from insomnia, and finally failed to recognize her relatives. She was cared for at home for four years but she required constant attention. She deteriorated gradually. She became careless of her personal appearance often wetting and soiling her clothing. She had visual hallucinations.

On admission to the hospital physical examination showed abdomen, lungs and heart negative; some arterio-sclerosis; some subjective complaints of headache and dizziness; pupils and reflexes normal.

Mentally she was confused, amnesic, poorly oriented and much deteriorated. Her memory was defective for both remote and immediate past;

at times she fabricated. She had neither insight nor judgment. She was childish.

During her twenty months residence at the hospital there was no change in her mental condition except for a progressive deterioration. Physically she declined steadily. She was bedridden for 15 months before her death on account of general weakness. Broncho-pneumonia caused her death.

Autopsy Abstract.—Brain 870 grams. Chronic pachymeningitis, pia edematous, vessels of brain atheromatous, lateral ventricles dilated, the frontal, right supramarginal, right angular and right superior parietal and left anterior central convolutions were very much atrophied making a worm-like appearance; advanced atheroma of the arterial system; broncho-pneumonia; cholelithiasis; chronic interstitial nephritis; cysts in pancreas as result of obstruction of pancreatic duct by gall stones.

CASE XLVII.—E. G. C., No. 980, farmer, 71 years of age. Three maternal uncles were insane (types of psychoses unknown), two of them committed suicide; a niece also has been insane; two sisters have died of "paralysis." His psychosis developed at 70. He developed a depression; had an idea that his family was going to starve, that they were going to freeze and that they were going to burn up. He refused food and was much agitated. This condition developed rapidly.

On admission to the hospital at the age of 71 a poorly nourished old man presented. Heart and lungs negative. Arteries much thickened, blood pressure 190; pupillary, superficial and deep reflexes normal.

Mentally he was excited, intensely fearful, anxious, agitated and had delusions of self-accusatory nature. The picture looked much like an involution melancholia but there was a memory defect for both remote and recent events.

During his two months residence at the hospital his mental condition did not change. Lobar pneumonia caused his death.

Autopsy Abstract.—Brain 1410 grams. Chronic pachymeningitis, chronic leptomenigitis, edema of pia, atheroma of all cerebral vessels, convolutions of frontal and central areas especially atrophic, acute softenings involving cortex and marrow in right posterior second frontal convolution extending just into the right anterior central convolution, and in left internal and middle orbital convolutions; hypertrophy of the heart, right heart dilated, mitral valve incompetent; atheroma of arterial system; lobar pneumonia, gray hepatization; chronic interstitial nephritis.

CASE XLVIII.—M. L., No. 993, widow of farmer, 63 years of age. No family history of nervous or mental disease. Patient had always enjoyed good health until 58, when she began to have heart trouble with dyspnea and edema of ankles. Her psychosis is said to have been gradual in its onset. Early in her 64th year she began to be restless, at times believed she saw her dead relatives, frequently became fearful that her home was to be burned or that some harm was coming to her; at times she was quite depressed and agitated.

On admission to the hospital a poorly nourished woman showing well-marked senile changes presented. Special senses, cutaneous sensibilities and reflexes normal; heart enlarged, mitral insufficiency poorly compensated; considerable arterio-sclerosis, blood pressure 150; chronic interstitial nephritis.

Mentally she was talkative, irritable, partly oriented, memory defective, judgment and insight poor. Later she frequently made mistakes in identity of people; at times believed she was to be shot and thought her daughter had been drowned in the cellar. At these times she was emotional and agitated and very apprehensive. She was resistive. It was necessary to feed her several times because she refused food.

Physical failure was steadily progressive and she died of chronic endocarditis, mitral insufficiency and chronic interstitial nephritis after a hospital residence of 38 days.

Autopsy Abstract.—Brain 1080 grams. Chronic pachymeningitis, edema of pia, atheroma of cerebral vessels, convolutions generally atrophic; hypertrophy of heart, both sides of heart dilated, chronic endocarditis; atheroma of arterial system; some small red infarcts in lungs; cholelithiasis; chronic interstitial nephritis; chronic perisplenitis and chronic interstitial splenitis.

In the whole series of cases, 40 were diagnosed senile psychoses. Twenty-eight of the cases so diagnosed showed miliary plaques, 70 per cent. All of these cases showed memory and judgment defects, the degree of deterioration being more extreme in the cases with plaques. The average age of onset was 68.7 years in plaque cases against 66.9 in non-plaque cases; the age at death was 74 and 71 respectively. Physically the plaque cases showed more of the symptoms of organic cerebral involvement, and the frequent occurrence of cardiac lesions was also striking. All of the senile psychoses showed brain atrophy either focal or general, but the weight of the plaque brains was less than the weight of the non-plaque brains.

All but one of the plaque cases presented brain atrophy. This case was diagnosed clinically involution melancholia and was 61 years old. The most atrophic brain of the series, 700 grams from a female, showed miliary plaques. Nine male brains and five female brains presenting plaques were within the accepted normal weight, but all showed atrophy with the exception of the involution case just mentioned; four of these showed hemorrhage into the ventricles or brain substance and eight showed edema of the pia; both of which conditions account for increased weight in the presence of atrophy. It may be fair to state then, that all but one

plaque brain showed decrease in weight, atrophy in itself being an index of the decrease.

Forty-four of the 58 elderly cases without plaques showed brain atrophy; 23 showed normal weight brains, but atrophy was present in 16 of them. It is of interest to note here, that none of the 14 non-plaque cases without atrophy were clinically senile psychoses.

So over 97 per cent of the plaque brains showed macroscopic atrophy against 75 per cent of the non-plaque brains in elderly cases.

All but four of the plaque brains show macroscopic cerebral arterio-sclerosis. One which did not show arterial degeneration at autopsy demonstrated it microscopically. Thirteen exhibited either cortical softenings, medullary softenings or lacunar softenings in basal nuclei; four were apoplexies; and four had internal hemorrhagic pachymeningitis. All but six of the non-plaque elderly cases presented cerebral arterio-sclerosis at autopsy. Sixteen exhibited either cortical, medullary or lacunar softenings in basal nuclei; three were apoplexies; and five had internal hemorrhagic pachymeningitis.

Arterio-sclerotic lesions, then, occur in 47 per cent of the plaque brains and in 34 per cent of the non-plaque brains.

This gross anatomical analysis shows that atrophy is almost always present in plaque-containing brains while it is quite commonly absent in non-plaque brains, even in elderly cases; and that arterio-sclerotic lesions are more often found in plaque brains than in those not demonstrating plaques.

Sections from the frontal, central, paracentral, occipital, hippocampal and orbital convolutions, and the basal nuclei of the cerebrum; the cervical cord; and the cerebellum were examined in each case. When areas of softening existed, sections of such tissues were examined in an effort to determine their relationship to plaques. Atrophic areas were also given special attention.

Bielschowski's silver impregnation method, the Levaditi silver method as employed by Hauptmann, hematoxylin and eosin after alcohol and May's modification of Zenker's fixations, Pappenheim's plasma cell stain, Mallory's glia stain, Nissl's stain, Herxheimer's fat stain as modified by Lambert, and Mayer's stain for amyloid were used in the preparation of sections for microscop-

ical examination in these cases. The Levaditi method and the Bielschowski method best demonstrate the plaques. In one case plaques were demonstrated by the Levaditi when none were brought out by the Bielschowski. In nearly all cases the Levaditi stain brought out the plaques in larger numbers and in greater variety than the Bielschowski. It should be used in all senile, presenile, arterio-sclerotic, brain syphilis and general paralysis materials as a routine procedure. Hematoxylin and eosin demonstrate the foci in nearly all cases, but does not give the detail or contrast given by the silver methods. Mayer's stain for amyloid was used in an effort to determine the relationship between corpora amylacea and miliary plaques, if any such relationship existed.

The so-called miliary or senile plaques are minute foci of tissue alteration usually irregularly circular or oval in outline, measuring from 10 to over 100 micra in diameter. There are several types. The one which is most common and which is here regarded as the mature type of plaque has a homogeneous, darkly stained mass at its center larger than a nerve cell and circular in outline. This mass takes the scarlet fat stain. It often appears brown in Bielschowski and Levaditi preparations. Sometimes two or three distinct masses are present with clear spaces or channels between. About the central darkly staining mass there may be a comparatively clear space or court. This court is as often not present. Then extending from the central mass to the periphery of the plaque is a zone in which a variety of altered structures are manifest. Fragmented fibrils, neuroglia and nerve fibrils, granular amorphous material, degenerating nerve cells and neuroglia cells, fat granule cells and pigment granules are found in this zone. Many times axis cylinders are seen to traverse the zone in the same plane without apparent injury; and again coarse, club-shaped twisted fibers are present, disposed radially from the center of the plaque resembling actinomycosis formations suggested by Achucarro. Peripherally the plaques seem to be enclosed in a fairly defined ring of dark fibres, which, as apparently isolated formations, lie in unstained tissue. The encapsulating neuroglia reacts to the plaque as it does to foreign bodies, softenings and corpora amylacea. The presence of rod cells in the vicinity of the periphery of plaques is unusual in this material.

Another type of plaque best demonstrated by the Levaditi process, and regarded as a step backward in the genetic development, contains no central mass or pericentral zone. It consists only of coarse black fiber network, which is more loose and may be followed for a greater or less distance into the unstained tissue. In successive stages the network is seen to become more loose and finer, and the peripheral thickening is diminished in compactness until the ground substance shows as a reticulum in which a net of brownish yellow fibers stand out alone. This is the so-called fassernetz type. By the Levaditi method isolated minute stellate forms and spread-out, irregularly outlined fiber networks appear to be the earliest manifestations of the plaque development. By the Bielschowski method the early types are larger and appear as focal necroses or pathological deposits of homogeneous material spread over 100 or more micra and without apparent surrounding neuroglia reaction. In succeeding stages the peripheral neuroglia reaction is more and more developed and the area shrinks to the mature type.

All of the types mentioned are often found in the same case. They are frequently in the same field lying side by side; but as a rule each area examined has a type of plaque which more or less prevails over all other types. One is led to believe from the variety of plaques and their apparent gradation one into the other, that the different types of plaques indicate different stages in the development of one type of mature plaque.

Topographically the plaques are found in the frontal, hippocampal, central, paracentral, occipital convolutions, and the basal nuclei in the order of the frequency of their occurrence. Aside from plaques this is the order of the histological changes in the brains of aged persons. They were also found in the orbital, temporal and parietal convolutions, but not all of these regions were systematically searched in each case. No plaques were found in the cerebellum or in the cervical spinal cord. The largest plaques were generally found in the hippocampal cortex.

Plaques appear to be largely confined to the cortex or gray matter, comparatively few being found in the white marrow. Rarely plaques seem to approach the pia or surface of the cortex. They are occasionally seen in the deeper portions of the molecular layer and one may extend well into the middle of this layer, but seldom

to its surface. Most of the plaques lie in the nerve cell bearing strata; more in the layer of small pyramids than in any other layer. The plaques which do occur in the white matter generally lie close to the last nerve cell bearing strata of the cortex, where there are occasional nerve cells still found. However, plaques have been rarely seen in the middle of the stalk of a convolution far from any nerve cell bearing tissue.

Attention has been directed to the frequent relation of the plaques to blood vessels. In this series capillaries coursing directly into plaques and apparently ending there have frequently been encountered, and in nearly all sections capillaries have been seen in close relation to plaques. In the Levaditi preparations, especially, an interesting condition is demonstrated. On either side of small vessels and capillaries there are seen quite wide strips of altered neuroglia. The structure and appearance of these areas are very similar to the fassernetz type of plaque. Whether or not this reaction about small vessels has any significance as to plaque development remains to be worked out. On the other hand, perhaps as many plaques without demonstrable vessel or capillary relations are also present. This does not dispose of the possible vessel relationship, however. The vessel might or might not appear in the section, the direction in which it is cut making the difference; or the section might be made from the extreme periphery of the plaque. This relationship or lack of relationship between vessels and plaques might be determined by making serial sections of pieces of tissue containing plaques.

Occasionally instances of the coalescence of two plaques have been found. When this occurs the plaques involved have been of the early type and have had no appreciable neuroglial encapsulation.

The association of plaques with Alzheimer's intracellular neurofibril alterations occurred in only four cases in this series. In two cases the intracellular neurofibrils were altered and thickened, but no basket formations and whorls were present. These alterations were most often found in the small pyramidal cells in the frontal cortex, the frontal convolutions in each case being extremely atrophied. This finding is in marked contrast to Barrett's findings in a series of eight plaque cases, five of which showed the neurofibril alterations, and Fuller's findings in a series of 16

plaque cases, eight of which showed the Alzheimer alteration. That there may be an etiological relationship between plaques and this neurofibril alteration is suggested, but the hypothesis that nerve cells disintegrating with neurofibril changes form the basis on which plaques develop does not appear tenable when only four out of 36 plaque cases showed the neurofibril alterations.

In the majority of cases plaques were most numerous in the convolutions showing greatest atrophy; but on the other hand, many cases with extreme atrophy did not demonstrate plaques.

Sections which showed arterio-sclerotic softenings did not demonstrate more plaques than sections without.

Corpora amylacea were present in nearly all of the cases, but their location and number differed so much from the location and number of the plaques that they cannot well be considered as having any connection with the plaques. They were so numerous in the cord and cerebellum where no plaques were demonstrated that relationship seems at best far distant.

Microscopically the sections from the senile plaque brains did not differ materially from the sections of the senile non-plaque brains except for the presence of the plaques. They all showed characteristic senile changes. The pia was generally thickened to several times its normal thickness by fibrous tissue and endothelial cell proliferation. Fibroblasts were numerous in the connective tissue mesh, occasional lymphoid cells, some kornchenzellen, rarely mast cells and very rarely a plasma cell. The walls of the pial and cortical vessels showed varying grades of changes. Most of the vessels showed regressive processes, though some of them seemed to be thickened concentrically. The Bielschowski process showed a fibrous network in the walls of many of the smaller cortical vessels. In some instances this structure was differentiated with difficulty from the basket formations and whorls of the Alzheimer neurofibril alteration. The molecular layer showed a thickening of the neuroglia felting. Corpora amylacea were usually present beneath the pia. A few were seen in the deeper layers in relation to vessels. They are numerous in the posterior columns of the cervical cord. Neuroglia nuclei were increased in number throughout the cortex. Satellitosis was moderately developed in a few cases, but was insignificant and inconstant. A few rod cells were scattered about promiscuously. In

most of the cases the nerve cells in the layer of small pyramids were diminished in number. Their cell bodies were shrunken and distorted and stained diffusely with the Nissl stain. The larger pyramids and Betz cells showed pigmentary alterations, in some instances the pigment occupying the whole cell body. Many of the nerve cells showed large vacuoles and others stained so faintly that they were mere shadows.

From this material and that already reported in the literature by several authors the following deductions may be made:

A large proportion of the cases diagnosed clinically senile psychoses (70 per cent in this series) demonstrate miliary plaques.

There are some senile psychoses whose brains do not demonstrate miliary plaques, but show the other characteristic changes of senile involution; although Barrett makes the statement that "the absence of plaques or their occurrence in few numbers is against the presence of senile dementia."

Cases which course clinically as senile psychoses but develop in the presenile period, generally demonstrate Alzheimer's intracellular neurofibril alterations in the pyramidal cells of the most atrophic convolutions in addition to miliary plaques and other histopathological involution changes.

Plaques are found in psychoses of long duration in patients of advanced age, but which are not originally senile psychoses. This may be an argument in favor of superimposed senile dementia.

Plaques are seldom found outside of the senile period; though Alzheimer found them in a case of tabes, aged 31, without a psychosis.

They have been found in old cases who have had no psychoses.

The rare occurrence of the presbyophrenia symptom complex in these cases is strong argument against the statement of Fischer that plaques form the anatomical basis of presbyophrenia; and there is no apparent reason for attributing to plaques a bacterial origin, though the possibility of a toxic origin is admitted.

Brains in which plaques are found generally exhibit macroscopic arterio-sclerosis and a large percentage exhibit gross focal lesions resulting from arterio-sclerosis. But arterio-sclerosis and arterio-sclerotic foci also occur in brains without plaques and cannot be regarded as direct factors in plaque development.

All but one of the plaque brains in this series exhibited either general or focal atrophy, although some were within the accepted normal weight. In most of these brains the atrophy was most marked in the frontal convolutions, the region which was most productive of plaques. Senile brains not showing plaques also exhibited atrophy, in some instances an extreme degree.

The order of the frequency of the occurrence of the plaques in the convolutions of the cerebrum was as follows: frontal, hippocampal, central, paracentral, and occipital. Some were found in a few instances in the basal nuclei. No plaques were found in the cerebellum or in the cervical spinal cord.

Different stages in the development of plaques may be demonstrated.

The duration and severity of the psychosis have no apparent relation to the stage of plaque development in this series, though Barrett noticed such relationship.

The Levaditi method as used by Hauptmann demonstrates greater numbers and more varieties of plaques than any other method known to the author.



THE DIAGNOSIS OF THE HIGHER GRADES OF MENTAL DEFECT.*

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Many factors have contributed to the present keen interest in everything pertaining to the feeble-minded, both in Europe and in this country. The realization of the vast extent of mental defect, the inexorable requirements of the modern graded school systems with the study of the resulting retardation, the significance of feeble-mindedness as an antecedent and cause of delinquency, crime, pauperism and other social diseases, the popular application of the Binet and other psychological tests and the comparatively recent discovery of the markedly hereditary nature of feeble-mindedness, are some of the causes of this interest.

Feeble-mindedness has become a subject of vital and pressing significance to physicians, teachers, court officials, social workers and legislators. The subject is being studied from medical, biological, pedagogical, psychological, sociological, economic and eugenic points of view.

The field of mental defect has been so broadened and extended as to include large groups of persons who would not have been so included even a decade ago. Naturally this extension has been almost entirely in the higher grades of defect.

A medical diagnosis of feeble-mindedness is necessary before a case can be properly or legally considered with reference to care, treatment or prevention. The practical importance of this pertinent subject is the excuse for this paper.

During the past twenty years over 3000 cases of suspected mental defect (an average of three a week) have applied to the Massachusetts School for the Feeble-minded for diagnosis, prognosis and advice as to treatment and care. These patients were generally referred by physicians, charity and social workers, child-helping societies, court officers, etc. As a rule the cases seen in this out-patient work are of the high grade "moron" type, often

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not obviously defective. Often a wide difference of opinion has been expressed by different physicians. Some of the cases have a criminal or court record. Cases of ordinary evident feeble-mindedness are not usually so referred. These cases evidently differ from the general run of presumably defective persons presenting themselves to a school physician or to a general medical clinic.

In this class of cases a diagnosis is usually sought for the purpose of deciding the patient's future. Is he normal or mentally defective? Is he able to attend the public schools or to go to work? Will he eventually be self-supporting? Shall he be held responsible for his criminal or immoral conduct? Is he a suitable case for adoption? The question of the suitability for marriage is sometimes involved. The diagnosis is of enormous importance to the patient and to his family. A wrong diagnosis is embarrassing to the physician and tragical to the patient.

The diagnosis of ordinary cases of idiocy and imbecility is a simple matter. Even the high-grade cases occurring in childhood present few difficulties. The upper levels of the so-called moron grade as seen in late childhood, and adolescence, are often most perplexing and difficult.

An accurate and incontestible diagnosis of one of these borderline cases can be satisfactorily made only after a thorough physical examination of the patient, knowledge of the family history, personal history, especially the story of his infancy and early childhood, school history and records, social and moral reactions, sexual habits, emotional stability, associates, interests, and the fullest inquiry as to his general information and practical knowledge. Appropriate psychological investigation by formal tests is especially indicated in these doubtful cases. The recent literature of the subject abounds in most elaborate and voluminous syllabi for routine examination and record, but a simple record of significant positive and negative findings is the most practical for diagnostic use. More than one examination is often required. It may be necessary to place the patient in a selected environment where his behavior and reactions may be carefully watched by a competent observer for a period of weeks or months before a final diagnosis and prognosis can safely be made.

A carefully written history of the case, prepared in advance by the parent, social worker or physician, saves time and often

presents facts which otherwise would be omitted or distorted. This statement of the case should include the reasons for thinking the patient mentally defective.

A physical examination will reveal any existing deformities and abnormalities—paralysis, scars, or other evidences of injury, especially to the head; the condition of the eyes, skin, hair, thyroid gland and sex organs; evidences of syphilis, rickets, etc. Height and weight with reference to the age is of importance. The circumference of the skull and the cephalic index should be noted.

The presence or absence of certain physical degenerative stigmata is significant, such as abnormalities in the size and shape of the cranium; abnormal variations in the size, shape and relative position of the ears; facial asymmetry, disproportion and lack of expression; the form, situation and structure of the teeth, etc. One or more cranial or physical developmental defects are generally found even in the slighter degrees of defect, especially if the case is of hereditary type.

Even the highest types of mental defect may have a certain degree of defective motor ability, as shown by awkward gait, clumsy movements and bodily attitudes, and a lack of alertness and dexterity. They often lack the physical grace and charm of well-formed normal youth. The performance of a sequence of movements requiring precise muscular co-ordination adapted to the age and apparent mental ability of the patient will show his co-ordinative ability.

The general personal ensemble is worth considering. The physical appearance, facial expression and attitudes, and the general bearing of the patient are factors to be noted. As a rule, mental defectives are not physically attractive or pleasing in appearance. A bright, alert, active, well-formed, attentive youth is usually not feeble-minded. The general impression of associates and neighbors of the patient as to his mental efficiency or inefficiency is often illuminating.

It should be remembered that no family history almost always means a bad heredity. The family history should be verified and amplified by someone outside the immediate family. The modern social worker has greatly simplified this part of the problem. There is a strong tendency on the part of relatives to suppress the suggestive existence in the family of other cases of mental defect,

epilepsy, insanity, specific disease, criminality, immorality, social and economic inferiority, etc. Such vicarious manifestations of family inferiority are most significant in view of the fact that presumably 80 per cent of defectives come from feeble-minded families.

The personal history, if obtainable, should chronicle injuries or accidents at birth, the order of birth (whether first or last child in family), diseases, accidents, convulsions, the age at which patient was able to sit up, to stand, to walk, to button clothing, the age at which he began to talk, the time when the first symptoms of mental defect were noticed, etc. Some cases with very slight mental defect are persistent bed-wetters up to adult life.

The unmorality of the feeble-minded is proverbial. The ability to appreciate in theory as to what is right or wrong is not applied in practice to their own conduct and actions. Inquiry should be made as to a history of general moral insensibility, untruthfulness, theft, cruelty, destructiveness, truancy and vagrancy, etc., in varying degrees. The presence or absence of sex precocity, sex perversion and sex immorality is very significant.

Allied to the unmorality of the high-grade imbecile are the various anti-social tendencies often expressed by selfishness, egotism, excessive vanity, absence of shame, general incorrigibility, lack of affection and lack of sympathy.

The pedagogical history as shown by a detailed account of school life and progress is most important evidence. The school record will tell the age at which patient began to attend school, the number of years in each grade, the present grade, school performance, with samples of his written work, and often a full and detailed account from his teachers of his successes and failures. Lack of educational advantages, unfamiliarity with the language, absences from school due to truancy, illness, or lack of interest on the part of the parents, have a bearing on the rating of the school performance. As a rule, the family blames the teacher or the school for the retardation. The teacher's report will usually tell a story of inattention, lack of ability to discriminate, or want of sustained interest and application. Retardation amounting to three years below the age grade, with no handicap of ill-health or unfamiliarity with the language, etc., is strongly suggestive of mental defect.

The social reactions should be carefully noted. Has the patient made good socially for his station in life? As a child, did older children accept him as a playmate on terms of equality? Was he teased, or abused, or "picked upon" by other children, especially by those younger than himself? Is he annoyed and teased by his fellow workmen? Does he associate with his social equals or with his inferiors? Does he associate with and play with younger persons? Does he make friends easily? Does he attend church and Sunday school? Did he at the usual age receive first communion or confirmation, or its equivalent? Does he observe the usual amenities and social conventions of his station? Is he treated as politely as other young men by young persons of the opposite sex? Does he attend and take part in parties and other social occasions?

The practical personal examination of the patient for subjective criteria of mental capacity and ability should be conducted without the presence of parents or other friends. And here again, no formal syllabus can define the line of inquiry to be followed in a given case. The queries must be varied to fit the age, sex, educational, social and environmental advantages, personal interests and experiences, personality, degree and type of defect, etc. If the patient is cordially put at ease and encouraged, he will usually tell all about himself, his sports, work, friends, hopes and plans. The city gamin and the country boy will have entirely different interests. Girls are likely to have had meagre view-points and opportunities. "Boarded-out" and "charity" children as a rule have barren experiences to draw from. Medico-legal cases may have been carefully coached not to know or not to remember.

Incidentally, the inquiry should demonstrate the patient's power of attention, judgment and common-sense, veracity, discrimination, constructive imagination, etc., as well as his stock of general knowledge and information, and actual scholastic ability. Does he know what he ought to know, and can he do what he ought to do?

The following questions, always varied or modified to suit the particular case, only indicate the general line of inquiry likely to show the mental capacity and ability. The answers elicited will suggest further queries.

How old are you?

Where do you live?

Is it a city or a town?
 How far from Boston (or the nearest large city)?
 What is the railroad fare from Boston?
 What towns are near your own town?
 What year were you born?
 How old are your brothers and sisters?
 Name some large cities in Massachusetts.
 What is made in Lynn, in Lowell, in Waltham?
 Name some rivers in Massachusetts.
 Name some mountains. Where are they?
 Who is Governor of Massachusetts?
 Who is President of the United States?
 Do you read any newspapers? Which ones? Which departments?
 What news in the papers recently?
 What books have you read? Tell the story of one.
 How high is this door?
 How tall are you?
 How much do you weigh?
 How long is this pencil?
 Who is the King of England?
 Do you play baseball? What position?
 Did the Red Sox win yesterday? What was the score?
 Who was the pitcher?
 What was your mother's maiden name?
 What did you see on your journey this morning?
 What job would you like?
 Where have you worked?
 Why did you leave your last job?
 What did you like to do best?
 What wages did you get?
 What wages does a carpenter get? A cook? A waitress? etc.
 What does a pair of shoes cost? A hat? Gloves?
 Name some flowers, vegetables, animals.
 What size shoe do you wear?
 Describe streets, mills, buildings, etc., in your town.
 How long would you boil an egg?
 How long would you bake a potato?
 How much does a baseball cost?

The scholastic ability should be actually tested by ordinary examination in the studies of the usual school grades. The patient reads from a school-book and copies a story. Oral and written sums may easily be devised to measure his arithmetical ability. All grades of mental defect show poor arithmetical skill. They may add and multiply, but usually subtract with difficulty. They may do short division, but few can achieve long division, except after long training. Any practical arithmetical computation at all involved is quite beyond the brightest defective. Few can solve the problem:

If I give you a dollar and you go in town on the electric car and pay your fare and return, and buy stamps for three letters, how much money will you have left?

He may know the amount of the car fare and the price of stamps, but he cannot do the sum.

The general scheme of inquiry and examination so far described was in general use before the application of psychological tests for estimating mental efficiency and capacity. Definite psychological tests in some form are now an essential and practical part of the examination of suspected cases of mental defect, especially with the higher grades.

The Binet tests, in the hands of competent examiners, usually corroborate the results of clinical examination in the recognition of all degrees of mental defect in children under ten, and of pronounced defect in older persons. These tests are not so effective in detecting slight mental defect in world-wise adolescents and adults. In other words, the Binet tests corroborate where we do not need corroboration, and are not decisive where the differential diagnosis of the high grade defective from the normal is in question.

The Binet tests are not supposed to furnish an index to the *education* of the individual, but to measure his *capacity for education*. But would not many ignorant normal persons fail to be able to tell the difference between pleasure and honor, evolution and revolution, event and advent, poverty and misery, pride and pretention, as required by the adult test?

The revised Binet tests require a person to listen to the following story, and then to repeat its substance:

One hears very different judgments on the value of life. Some say it is good, others say it is bad. It would be more correct to say that it is mediocre; because on the one hand it brings us less happiness than we want, while on the other hand the misfortunes it brings us are less than others wish for us. It is the mediocrity of life that makes it endurable; or, still more, that keeps it from being positively unjust.

The words "mediocre" and "mediocrity" are usually unfamiliar to any person likely to be examined for mental defect.

The Binet tests are psychological experiments and to give results of definite value should be conducted with all the precautions against error which are observed in other psychological experiments. There is still some question as to the invariable fairness of these tests, in subjects with which the patient has had no practical experience, as a measure of native mental ability. The mere appearance of the unfamiliar apparatus or test material may so confuse the patient that he will not be able to do himself justice. The results of any formal tests should accord with clinical findings and with pedagogical measurements and social and economic reactions. The determination of mental defect cannot be made by the automatic application of any method and scale. In the borderline adult cases the Binet tests are of value as *additional evidence*, but they are not conclusive and should not be relied upon in the absence of clinical and other evidence.

The Binet test does not register as defective certain persons who present plain evidence of mental defect in their personal history, school history, and performance, social and economic reactions, etc., while on the other hand, certain individuals who fail to come up to the requirements of the Binet test do not present the usual personal, social and economic reactions of mental defect.

The layman, especially the social worker and the teacher, is profoundly impressed with the findings of any formal tests. The facility with which the pronounced case of mental defect can be roughly indicated with these tests is largely responsible for the present great popular interest in feeble-mindedness.

The Binet tests are most effective as first aids to teachers and social workers in selecting suspected cases to be referred to the physician.

A bit of personal experience illustrates the difficulty of eliminating irregular test conditions, and the futility of absolutely follow-

ing any system of scoring. On one of my out-patient days, I had examined eight patients, one after the other. I had no luncheon and was fatigued physically and mentally. At 5 o'clock a social worker insisted that I examine, as I had agreed to do, her 15-year-old patient. I pleaded weariness and disinclination, but finally decided to give the Binet tests. The patient had waited hours for her examination and was tired and unhappy. After much effort she utterly failed to achieve the 10 or 11 year Binet tests. I declined to give an opinion, but made another appointment for the next morning, when, after the patient had been put at ease and got acquainted, she readily tested up to her full age. The result the night before was really a record of my own mental state.

Healy has formulated a tentative series of psychological tests for the estimation of native mental ability and the results of formal education in adults and adolescent delinquents not definitely feeble-minded. They are of great practical value in demonstrating various shadings of the borderline zones of mental defect, as well as certain types of delinquent personality not yet generally recognized as variations of mental deficiency or of limited responsibility. The generalizations from the application of this admirably flexible and comprehensive method of examination should furnish data of great value in diagnosis and classification.

The differentiating tests of Dr. G. G. Fernald form another notable addition to the methods of scientific precision for the diagnosis of variations of lesser mental defect as found in adolescent delinquents, presumably differing in no way from the degrees of defect in non-criminal individuals.

Dr. Healy and Dr. G. G. Fernald both emphasize the fact that the application of psychological tests should not constitute the exclusive method of examination, but that it is one method available among others, and to be supplemented by them. Indeed, as Dr. Fernald says, in the present state of our knowledge any attempt to classify any group of subjects based solely on the findings from psychological tests would commit grave errors.

Practically all of the special tests for the diagnosis of doubtful cases that are not decided by usual tests are of doubtful value because no age norms are given, and no practical method of scoring worked out. We can draw no exact conclusions from the

results of tests in any given case when we do not know what results we would get with these tests on normal persons. Absolute standards should be used with great caution. There are many grades of intelligence among normal people. Normality of intelligence is not a fixed strength of intellect, and feeble-mindedness is not merely a question of intelligence.

The psychologists have been so interested in the diagnostic application of the Binet and other tests that while we are now familiar with certain rather empirical negative age standards and landmarks applicable to children and to cases of pronounced defect, we still possess no really scientific understanding of the exact psychological status of the ordinary cases of feeble-mindedness. We know that these different groups are, in varying degree, low in the power of voluntary attention, in discriminatory power, in constructive imagination, etc., but we know this only empirically, not in terms to be expressed qualitatively and quantitatively. The psychology of mental defect is yet to be written. The patient work of G. E. Johnson, Kuhlman and Norseworthy along these lines should be followed up by intensive psychological study and analysis of a large series of carefully selected cases. The work cannot be done adequately in a small institution laboratory but requires the personelle and the resources of the psychological department of a great university. Such research would accumulate data for generalizations which would form a basis for the formulation of tests of enormous value in the diagnosis of puzzling cases, especially of the borderline class. It is probable that the scientific mind will not be content until these upper zones of mental defect have been explored and charted, and definite diagnostic tests evolved.

From a clinical point of view the borderline case of the "moron" grade differs from the case of actual imbecility quantitatively rather than qualitatively. Even in cases with very slight mental defect some of the cardinal symptoms and conditions of imbecility are usually found in lesser degree. There are generally evidences of physical inferiority, certain physical stigmata of degeneracy and defective muscular co-ordination. There is usually a history of delayed dentition, late walking, delayed speech and relatively long continuance of untidy habits. The patient lacks the appearance of expression of normal mentality. There

is usually a history of mental defect or disease in the family. Unmoral and anti-social tendencies are rarely absent. There is a history of school retardation and poor scholastic ability on examination, with special difficulty in arithmetical and practical computations, and lack of general knowledge and information. The patient is unable to apply himself continuously in any one direction and is willing to risk severe penalties for some very small gain. His actions and conduct indicate a lack of good common sense.

These facts and observations may usually be corroborated by psychological tests, but there is no justification for the popular belief that a psychological examination alone will quickly, accurately and fully determine the degree of mental efficiency or inefficiency, educational and social needs, and the prognosis of patients who have puzzled and baffled parents, teachers, family physicians and alienists.

Not all or even a majority of these various physical, psychical, social, ethical and economic stigmata are likely to be found in every case of actual mental defect of the higher grade. Mental defect has not yet been proven to be an homogeneous entity. The various signs and symptoms are found in infinite variety in varying degree and proportions in different cases. Certain persons who are not more than one year retarded as shown by the Binet tests are undoubtedly so mentally deficient as to be obviously "incapable of managing their own affairs" as shown by their long continued social, ethical and economic failures.

A given case must be finally decided after a careful weighing of all the evidence which any reputable method of examination and weighing can furnish.

The Binet tests assume the twelve year mental age as the upper limit of feeble-mindedness because observation and test showed that people of any higher intelligence are usually able to float in society. And, after all, the ability of a man to earn a living, to maintain himself independently in the station of life in which he is born is the one supreme test of mental normality. If a man can secure a paying job and keep it, and satisfy his employers, it is extremely unlikely that he is mentally defective. In cases which cannot be definitely decided, the patient should usually be

given the benefit of the doubt and allowed to work out his own problem under the best conditions attainable.

In these practical generalizations from the study of a large number of cases, the writer has sought to indicate the general lines of investigation which have been found useful and necessary rather than to enumerate all the signs and symptoms of mental defect which were revealed, or to present a mass of formal statistics.

DISCUSSION.

DR. BRIGGS.—I would like to call attention to the connection between this paper and Dr. Work's report yesterday morning. Such papers as this are going to help the physician in determining diagnoses of cases. In the State of Massachusetts they are calling on the State Board of Insanity to prepare a report making recommendations in regard to this matter. The State Board have a meeting next Monday, at which time there will be a discussion as to what impediments should be placed on marriages of mental defectives. I think this question is a very vital one. I understand that the Roman Catholic church is coming out strongly against restriction of marriage. It is against its belief to prevent marriage or to sterilize, and it will probably take an active part in these questions.

Notes and Comment.

S. WEIR MITCHELL, M. D., LL.D.—The death in Philadelphia early on Sunday morning, January fourth, of Dr. S. Weir Mitchell, came as a distinct shock to the members of his profession, as well as to the community at large, notwithstanding his advanced years.

Dr. Mitchell had lived such an active, virile life—was in such a marked degree, after passing the limit set by the Psalmist to a man's years, a living factor in affairs of medicine, in the field of literature and in all that related to the public weal, that the thought of a cessation of his activities through death was not readily associated with thoughts of him and his work.

Dr. Mitchell was born in Philadelphia, on February 15th, 1829, and had therefore nearly reached the age of eighty-five at the time of his death. He was educated in the grammar schools of his native city and in the University of Pennsylvania, but did not take an A. B. because of illness during his senior year. His degree of M. D. was taken at the Jefferson Medical College in 1850, and in 1888 he was given an honorary M. D. at Bologna. Harvard in 1886, Edinburgh in 1895, Princeton in 1896 and Toronto in 1906 conferred upon him the degree of LL. D.

He established himself in practice in Philadelphia, and early became known for his interest in physiological studies and subsequently for neurological investigations.

During the Civil war he had extended opportunities for study of gunshot wounds and other injuries of the nerves at the Turner's Lane Hospital in Philadelphia, established for the care of such cases, of which hospital he had charge. His work entitled "Gunshot Wounds and Other Injuries of the Nerves," written in conjunction with Drs. George R. Morehouse and W. W. Keen and published in 1864, was the result largely of observations made at the Turner's Lane Hospital. A larger work by Dr. Mitchell, "Injuries of Nerves and Their Consequences" was issued in 1872. In 1873 he published "Wear and Tear: or Hints

for the Overworked" and in 1875 "Rest in the Treatment of Disease." In 1877 "Fat and Blood."

The "Mitchell Treatment" as it has been called by some, especially on the continent, the "Rest Cure," detailed in the work issued in 1875, has been, with various modifications, generally adopted and practiced in suitable cases throughout the world, and the introduction and teaching of a systematic "rest cure" has made Dr. Mitchell's name more widely known to the medical profession than any other contribution which he has made to medical literature.

For many years he had been known as the leading neurologist of America, and naturally a certain proportion of his practice, which for many years has been almost wholly a consultation practice, has had to do with mental cases.

Little, however, has appeared from his pen, upon strictly psychiatric topics, indeed we can now recall nothing.

In May, 1894, at the fiftieth annual meeting of the American Medico-Psychological Association held in Philadelphia, Dr. Mitchell delivered the annual address.

It was only after much persuasion that he consented to deliver the address, and he says in his introductory remarks, "I have been sorry ever since" and it is within the knowledge of some that he did not cease to regret delivering the address.

One feels, after having listened to the address twenty years ago, and after reading it within a few days, that while no doubt many things which he then said hurt the feelings of many of his auditors, and upon such an occasion, the celebration of fifty years, organized work for the insane, were perhaps unwisely said, that they were said in the kindest spirit and with an honest desire as he said "to greatly use a great occasion."

It was through life a habit with Dr. Mitchell to place problems before his associates and friends, to send out a questionnaire upon various topics which interested him, and in preparing for the address he followed this custom.

To thirty of "one of the ablest groups of men known to me (he says) the neurologists and consultants of our cities" he sent out a letter asking for suggestions and apparently received many. It is a well-known fact that at that time the men to whom he referred were not either well informed as to the work and methods

of those responsible for the conduct of our hospitals for the insane, or in very great sympathy with them. Nor was the orator much better informed as to recent trends in hospital work and methods as shown in addresses delivered by Dr. Cowles and others at the same meeting. Many of the things he then suggested were already in practice, some were then and continue to be Utopian. Nevertheless, the address made a strong impression and accomplished some good and has been used on more than one occasion by ambitious medical officers of institutions for the insane to aid their arguments before managing boards for advanced methods, more medical assistance, better nursing.

For many years Dr. Mitchell's chief literary activities have been manifest outside of professional lines, though in some of his works he has shown the influence of, and has used with advantage his professional experience.

It is seldom given to one man to achieve fame in two distinct departments of endeavor. Dr. Mitchell accomplished this. After establishing an enviable reputation as a neurologist he entered the field of literature and as a novelist and a poet attained almost equal prominence, but he did not abandon his medical work. He was accustomed to take long summer vacations, when as far as possible he put aside medical work and entered upon the joys of literary creation.

He had published some fugitive pieces during and just after the Civil war and in 1867 a story in the *Atlantic Monthly*, but it was not until 1880, when he was fifty-one, that he published his first volume of stories. This was followed in quick succession by other works in prose and verse, but it was the appearance of Hugh Wynne, Free Quaker in 1898, which firmly established him as a novelist of note. At the age of seventy, a year after the appearance of Hugh Wynne, he wrote the adventures of Francois, and then the Red City, published in 1907.

Westways, which appeared within the year, is a story of the Civil war and though written in a style wholly different from Hugh Wynne, promises to achieve as great a reputation. It is stated, as illustrative of the author's great care to suit his language to the period he was depicting, that no word appears in Hugh Wynne which is not to be found in the first edition of Johnson's Dictionary.

It would require as critical an analyst of character and one as skillful in depicting it, as was Dr. Mitchell, to present a true picture of the man.

Investigator, clinician, consultant, poet, novelist, man of affairs—in all, the personality of the man loomed large. It influenced the lives and thoughts of all who came in contact with him, either personally or through the printed page—and ever and always that influence was for good. He had, to a marked degree, that which should accompany and gladden age—"Love, honor, obedience, troops of friends," beyond these he has passed, and in his own words we can express our faith that:

"There soul hath touched with soul, and there the great
Cast wide to welcome thee joy's golden gate."

POLITICAL CONTROL OF THE INSTITUTIONS FOR THE INSANE.—When institutions were first organized under medical control in the United States, much pains were taken by boards of trustees to secure men of first-class ability, who had received training and had experience in the care of the insane. Hartford Retreat became a Mecca to which boards of trustees journeyed to secure officers of new institutions. Thus Dr. Woodward was appointed at Worcester because of the experience gained at Hartford. Dr. Butler was appointed in turn at Hartford Retreat because of training at Boston and demonstrated fitness for the work. Dr. Ray was placed in charge of the Maine Hospital because of his record as an authority in medical jurisprudence and insanity. Bell, Chandler, Tyler, Rockwell and others received appointments in New England because of recognized fitness to assume charge of institutions. When New York desired a superintendent for her asylum at Utica Dr. Brigham was called from Hartford Retreat. When Michigan needed a superintendent at Kalamazoo Dr. Van Deusen was chosen from Utica. Illinois summoned Dr. Andrew McFarland from New Hampshire; and New Jersey, Dr. H. A. Bottolph from Utica. Dr. Pliny Earle of the Friend's Asylum was called to Bloomingdale and later was succeeded by Dr. C. H. Nichols from Utica. Examples might be multiplied but these suffice to show that for many years there was no political bias in the appointment of chief medical officers to institutions. The majority of states in fact have regarded the care of the insane too important

to be entrusted to incompetent hands. It is a sorrowful fact, however, that certain states have always been guilty of political control of their institutions and others which originally had a record of correct views have been drawn into the vicious stream of party politics. In Ohio the idea existed from an early day that institutions for the insane constituted a part of the party machinery and were legitimate spoils.

In early numbers of the JOURNAL OF INSANITY it is interesting to note the discussion which arose at a meeting of the association over the appointment of Dr. Firestone an inexperienced man in Ohio by a friendly political governor. It is a melancholy fact, however, that party politics became entrenched in the institutions of Ohio with disastrous results to the insane. It has not been uncommon to see all boards of trustees and all medical officers removed by an incoming governor under the foolish pretext that it was essential to have all superintendents and officers of state institutions in political accord with the governor. Dr. Richard Gundry, who had for more than twenty years given loyal, faithful and efficient service to the state, was removed from office because he was not of the same political party as the new governor of Ohio who had been elected to serve a term of *one year*. Illinois was free from the contamination of politics until the election of Governor Altgeld in 1893, when he reorganized all state institutions under men of the same political views as his own, with the result that such men as Dewey, Carriel and others were driven out of the state service. The demoralization of Illinois institutions in their progress from bad to worse was an object lesson for years. Fortunately public sentiment was aroused and a change was demanded which found expression in the establishment of a board of control and the divorce of all institutions from politics. It seemed that a bright future had opened for the institutions of the state and that Illinois had developed a system which would place her in the front ranks. These bright hopes have been blighted by the action of a newly elected governor who demanded the resignation of the board of control and drove out industrious and worthy superintendents to put men in place who are willing to use their positions to further his political ambitions. The experience of Kansas has been equally disheartening. For many years able and conscientious men have been driven from

office to satisfy party greed. The same system obtains in many of the Southern and Western states, and the question arises how long will the medical profession remain silent?

The effect of political control is to establish vicious standards of excellence and undesirable standards of fitness for hospital administration. It demoralizes the chief officer and his assistants and destroys the *esprit de corps* of the whole organization. It does nothing to foster a scientific spirit and banishes the possibility of continuous study and research. Indiana has passed through the deep waters of such political affliction and has recovered from it.

During the past summer there was reason to fear that appointments in New York institutions previously free from party politics were being grasped by politicians. The impeachment of the governor who was responsible for the attempt to destroy the former worthy traditions of all political parties checked the movement for the present time. It remains for the medical profession of New York and every state to assert itself to prevent similar attempts to degrade the public service.

As a by-product of the impeachment of Governor Sulzer the Civil Service Reform Association of New York has protested to Governor Glynn against political appointments in the state hospital service during July and August. One of the most notorious cases covered by the protest is the appointment of J. H. B. Hanify of New York as successor to T. E. McGarr, who had been secretary to the State Hospital Commission from its organization, who was an experienced man and who had rendered the state faithful and creditable service. It appears that Mr. Hanify was a member of a firm of plumbers prior to his appointment at the instigation of Governor Sulzer.

The association also protests, very properly, against the creation of a position as "confidential accountant" for the deposed Mr. McGarr, at a salary of \$2800.00 and maintenance, and exempting it from civil service competition. However much one may sympathize with the former secretary, one can hardly approve the method adopted by Mr. Sulzer to salve that gentleman's wounded feelings by creating a superfluous position in the state service.

Mr. Nelson S. Spencer, chairman of the association, stated in his letter that the State Hospital Commission on July 31 asked to have the position of secretary to the purchasing committee transferred from the competitive to the exempt class, giving as its only reason that "competitive or non-competitive examination is not practicable for filling the said position." The State Civil Service Commission granted the exemption whereupon William C. O'Hern was appointed. Concerning this appointee, Mr. Hanify wrote that "in the position mentioned special knowledge of purchasing methods is essential." The Civil Service Reform Association investigated the special training of Mr. O'Hern and made the interesting discovery that this particular expert in purchasing had for some time past followed the business of a saloon keeper in Hornell.

THE CARE OF THE INSANE IN PENNSYLVANIA.—After considerable hesitation extending over a period of years, during which the County Asylum systems of care of the insane was virtually endorsed, and little done to improve the state institutions, the Committee on Lunacy of Pennsylvania has practically come back to a realization of the fact that state care alone is proper for the dependent insane.

The condition of affairs which confronts the authorities in Pennsylvania as regards the care of the dependent insane is called acute. From our knowledge of the situation and from acknowledged facts we should call it chronic and of long standing.

The hospital at Harrisburg, with a capacity of 1000 patients, has, according to the Secretary of the Committee, 1582 patients. Dixmont, with a capacity for 600, has 971, Warren, with a capacity for 1282, has 1504, and Norristown, with a capacity for 2615, has 3297 patients. Danville hospital has but 16 more patients than its rated capacity of 1450. The Philadelphia Municipal hospital, Blockley, is usually over-crowded, but now to such an extent that we are informed that new admissions have been refused for some months and the same is true we believe at Norristown. The institutions at Wernersville and the new hospital at Rittersville are the only ones with vacant beds in the state—and in addition to these there are 8000 patients in county institutions.

We do not know fully who is responsible for this appalling state of affairs, though we may have some suspicions as to some of the causes.

Several years ago the state started an experimental programme in the care of its insane. The advice of those who by experience were presumed to have knowledge upon the subject, as well as the teachings of experience in other states, was ignored. No very definite or well-thought-out plan was laid down, and a period of vacillating as between state care and county care, between the establishment of an institution wholly for chronic cases or the reception at the same institution of acute and chronic cases followed, while nothing was done or at least nothing adequate to the situation was done, to lessen the over-crowding of the state hospitals.

How the situation is now to be met remains to be seen.

It would, however, be a distinct advantage to those upon whom falls the duty of meeting the situation to read the address delivered by Dr. Mitchell in 1894 in Philadelphia, to which we have elsewhere referred, and to heed much that he condemns, much that he advises.

The municipal hospital for the insane in Philadelphia condemned by resolution on more than one occasion by the Association is still in the same or worse state, if possible, than twenty years ago. A discredit to the city it is such by reason of the very conditions which Dr. Mitchell condemns so repeatedly in his address, the baneful influence of politics.

Book Reviews.

Inebriety. Its Source, Prevention, and Cure. By CHARLES FOLLEN PALMER.
(Philadelphia: The Union Press.)

This is a small book of 109 pages in which inebriety is discussed in a manner which will tend to make the subject clear to the lay reader. The author is not a fanatic and hence does not injure his cause by statements which are difficult to prove. His broadmindedness does much to convince one who might be inclined to be skeptical. A few of his chapter and section headings illustrate his method of handling his subject. The first chapter is entitled *The Nervous-Mental Organization* and is divided into sections on *Morbid and Perverted Sensations*, *The Neuro-Psychopathic Constitution*, *The Inebriate Diathesis*, and *The Distinction Made by Medical Scientists Between Hereditary and Acquired Inebriety*. In other chapters he discusses *Trained Will Power an Essential to Self-Preservation*, *The Remedying of the Preinebriate Morbid Conditions* and the *Strengthening of the Bases of Self-Control*, the *Inebriate's Continued Progress in Building up Moral Manhood*, and *Moral Characteristics and Various Types of the Inebriate*. As everyone who has dealt with inebriates knows, it is only by treatment which strengthens the will power that any lasting results are secured. It would seem that a perusal of such a book by an intelligent person might be of material assistance to him in making a fight against the drink or drug habit. He certainly could arrive at a better understanding of his condition and could therefore cooperate better with his physician. The latter's time could therefore be saved from a discussion of numerous details which might be necessary and yet are tedious. The book is printed and bound attractively.

W. R. D.

Fourteenth Annual Report of the State Board of Insanity of the Commonwealth of Massachusetts for the year ending November 30, 1912. (Boston: Wright & Potter Printing Co., State Printers, 1913.)

This most recent report of the Massachusetts Board is somewhat larger than former ones, covering 315 pages. Sixty pages are given over to the reports of the semi-annual conferences of the Board with the trustees of the different institutions. At the first the subject for discussion was *Size of Hospitals for the Insane and Feeble-minded*; at the second it was *Family Care*. There is much of interest recorded in the discussions of these subjects.

The whole number of insane under care October 1, 1912, was 16,507, or one to every 212 of the estimated population of the state. Of this number, 13,365, or 81 per cent, were insane. But 419 of the total were under private care.

There is so much of interest in this volume that brief extracts from it are impossible. Every superintendent should read the report of Dr. Southard, and also that part dealing with the purchase of supplies.

W. R. D.

Some Types of Attention. By H. C. McCOMAS, JR. Psychological Monograph, Vol. XIII, No. 3. (Lancaster, Pa., and Baltimore, Md.: The Review Publishing Co.)

This work was published some time ago and would have been earlier reviewed, but for some reason has been overlooked. Dr. McComas has done his work well and has given us an excellent analysis of the various factors entering into attention with especial reference to the Visualizer, Auditif, and Motor Type. These he groups as broad and narrow spanned. The description and comments on the experiments are most interesting, as are the conclusions. In summing up it is stated that "In view of these results it must be acknowledged that the Attention is a function of the cooperation of many factors of the mind and it takes its character from them. The activities of the Attention will not be understood until the relation to these component and controlling factors is understood."

W. R. D.

Beiträge Zur Frage nach der Beziehung Zwischen Klinischen Verlauf und Anatomischen Befund Bei Nerven und Geisteskrankheiten. Bearbeitet und Herausgegeben von FRANZ NISSEL. Erster Band, Heft I. (Berlin: Julius Springer, 1913.)

This volume forms the first number of a new series—Beiträge zur Frage zwischen Klinischen Verlauf und Anatomischen Befund Bei Nerven und Geisteskrankheiten—edited by Franz Nissl of Heidelberg. The editor's aim is to bring together such cases as present atypical features in the course, development and termination of the disease picture with the underlying anatomical background. In so doing, he hopes to be able to collect a sufficient number of cases which would enable one to form new groups. For after all the value of nosological entities depend upon such cases that were carefully observed clinically and worked up anatomically even with negative findings. Herein lies the great value of Nissl's new monograph. Three cases with complete post-mortem examination are described in detail. The first case was observed clinically by Wilmans and anatomically by Rank, the second case by Gruhle and Rank and the third one by Rank.

The first case was that of a man of 54; he was a chronic alcoholic, vagrant, beggar, and showed criminal tendencies. He had been an inmate of the workhouse, penitentiary and was also fined with money. He was brutal towards his wife and finally deserted her. At the age of 35 the right side of his body became paralyzed, lasting over six months. At that time he had convulsions which were accompanied by loss of consciousness and they occurred during the ensuing year. Occasionally psychic disturbances manifested themselves and gradually mental deterioration set

in. At 52 an acute mental upset developed. This was characterized by hallucinations and rambling speech. However, memory and orientation showed no marked impairment. Soon he became free from hallucinations and passed into a euphoric dementia. A month after his admission to the hospital convulsions of the Jacksonian type with loss of consciousness were limited to the left side of the body. A few months later another acute upset developed. At that time he reacted to hallucinations, expressed grandiose ideas, uttered peculiar expressions with formation of new words, and gradually his speech became anarthritic. Nine months after admission the patient died following status epilepticus.

Anatomically the following were found: Mesarteritis luetica; old area of softening in the right frontal lobe; Huebner's endarteritis luetica in some portions of the basillar arteries; over the whole brain well-defined histological changes were observed; in some places nerve cell alteration and in other places nerve cell destruction and proliferation of the elements of the walls of the blood vessels and glia cells were noted. In this case the whole brain was practically diseased; the greater part of it showed old processes; however in many portions recent pathological changes were in evidence. The clinical picture could be easily explained on the ground of these anatomical findings.

The second case was that of a man of 39; he was of alcoholic habits and three times suffered with lead poisoning. Since the age of 29 the patient had been afflicted with a psychosis. He reacted to hallucinations of all senses, had unsystematized delusions of persecution with periods of depression. He was also subject to attacks of fainting spells and temporary loss of speech. Gradually increasing mental decline with endogenous labile mood, marked irritability and silly behavior were manifest. In addition, grandiose ideas, incoherent speech, variable anarthritic speech disturbance, unequal but mobile pupils with typical paretic cerebrospinal fluid findings were observed. Eighteen months prior to death convulsions occurred and exitus was due to hemorrhagic pneumonia. Post-mortem examination showed the anatomical picture of atypical paresis with regressive vascular changes in the occipital cortex which cannot be differentiated from ordinary arteriosclerosis of a non-leutic origin.

The third case was that of a man of 52; he was an alcoholic and two years after contracting syphilis he developed a psychosis; he spoke very little, was afraid of people, wanted to sleep most of the time and would not do his work. We knew nothing of the somatic signs at the time of the development of these psychic symptoms; three or four months later he improved and was able to resume his work, but reduction of mental activity was noted; he worked much slower and was not as punctual as formerly. Seven years later the patient sustained injury to his head and following this an acute mental disturbance developed. At first he was depressed, inactive, complained of his head, and in a crying tone of voice he would declare that he could not do his work. Later he grew agitated and delirious. After this episode he became quiet but euphoric. At other times he was depressed and admitted a feeling of inadequacy. Finally he

passed into a delirium and he succumbed to pneumonia. Somatically he presented the usual signs of paresis with the characteristics serological and cytological findings. The histological diagnosis in this case was general paralysis with arteriosclerosis and areas of leucic vascular and gummatous areas of the brain. Central and peripheral neuroses of the spinal cord and local disturbances of the surface of the brain were in evidence.

A careful review of these three cases shows that their clinical pictures were atypical and the diagnosis in each instance *was not clear*. In the first case, several diagnoses were suggested—such as dementia præcox, chronic alcoholic psychosis, epileptic deterioration, brain tumor, cerebral syphilis, paresis and arteriosclerosis. The second case likewise presented many difficulties in making a proper diagnostic classification. The following diagnosis came under consideration:

1. An atypical case of paresis in an imbecilic epileptic.
2. A combination of paresis with dementia præcox process in an imbecilic epileptic.
3. There are rare cases of epilepsy which later develop into hallucinatory paranoia and paresis.
4. The influence of lead intoxication upon the clinical picture.

In the third case the diagnosis of paresis with remission and cerebral lues which ultimately terminated into paresis was discussed.

The presentation of this new series is high commendable and the editor is to be congratulated upon undertaking such a timely and profitable investigation along both anatomical and clinical issues.

KARPAS.

AMERICAN JOURNAL OF INSANITY

CHRONICITY AND DETERIORATION IN MANIC DEPRESSIVE CASES.

By SANGER BROWN, II, M. D.,

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As chronicity and deterioration are quite infrequently met with in the manic depressive psychoses, the description of a few cases showing this outcome is thought to be of considerable interest. Some observers from time to time in recent years have described these unusual terminal states, and the eight cases subsequently discussed tend to corroborate the views already expressed, rather than to add any essentially new material. This small group of cases has been unusually instructive to the observer, however, in that it is seen that the early accepted views expressed by Kraepelin regarding recovery were somewhat misleading. Kraepelin has recognized this fact and has included the description of chronic cases in his latest edition.

Schott,¹ in 1904, was probably the first to describe in a systematic way the occurrence of chronicity in manic depressive cases. He described in detail four cases which had been under observation for many years. All four cases had had manic attacks in earlier life, from which they had recovered. The final attack was at first characterized by the usual manic features, but contrary to the rule in such cases, recovery did not take place. All four patients finally showed a similar picture. They settled down to a somewhat monotonous existence in the hospital, being well enough to work in a routine way. The residuals of the former manic state remained, in that they were easily excited, somewhat quarrelsome, and given to silly pranks and jokes. They were subject to exacerbations of excitement from time to time.

Never did they gain insight or become stable enough to leave the hospital. With this came certain dilapidation of personality. They were selfish, unreasonable, and inconsiderate of others. With slight provocation they became talkative, active, and generally disturbed. Throughout, the manic features were readily demonstrable. They became elated, distractible, and at times showed flight of ideas. Hallucinations did not enter into the clinical picture, and delusional ideas, other than of temporary nature, did not develop. The four patients had been in this condition in the neighborhood of thirty, twenty-five, twenty-one and seventeen years respectively. Three of the four showed very serious hereditary predisposition and were of eccentric constitution. Schott felt justified in concluding that there are a certain number of cases which become chronic, at that time exhibiting the residuals of the former manic state, as well as showing a certain impairment in the higher intellectual spheres.

Rehm,² in 1907, in going over the course and outcome in a large group of manic depressive cases, found that a certain number were of chronic type. In many instances he found that the onset was in early life and that the course was a chronic one of circular nature.

Von Hoesslin,³ in 1909, made a similar investigation. After excluding those cases in which recovery was interfered with by such complications as arteriosclerosis and senile dementia, he found that there remained a certain number of chronic cases quite similar to those described by Schott.

Three cases of particular interest are described. One had had two previous attacks with recovery. The second had the first manic attack at the age of forty-four, which changed to a depression, and subsequently to a manic excitement. The third case will be described presently. The first two cases had been in the hospital over twelve years, and showed a similar picture. The manic attack had been typical in the beginning. The manic state remained in modified form and secondarily there had developed some exalted ideas of eccentric and bizarre type. There was a certain lowering of affective activity. The tendency to become over-active, and to make witty remarks, indicating considerable keenness of observation, remained. The writer thought that these conditions represented chronic manic states.

The third case was of unusual interest. It was that of a woman who had had two previous attacks of depression. The final attack was that of manic excitement. She had been under observation for twenty-two years. For thirteen years of this time the course was circular. It was then noted that when free from excitement, she was very dull and apathetic, rather than depressed. She sat about in a stupid way and became untidy in her habits. Although she appeared quite dilapidated, she was oriented, clear as to her surroundings and was rather more observant than her appearance indicated. The presence of retardation could not be established.

Von Hoesslin concludes that chronic states occur independent of arteriosclerosis and senile complications. A marked dementia is not observed, but a certain indifference and general mental reduction takes place.

Kirby⁷ was the first in this country to call attention to the chronic manic depressive cases. He describes the circular course in some instances, and the prolonged excitements and depressions in other cases. The constitutional manias and depressions form another group. Kirby calls particular attention to still another type in which the clinical picture has changed, and many of the manic features have disappeared.

Stransky,⁸ in his recent text-book, mentions the chronic manic states, but he does not express his views very clearly concerning the role which senile changes or arteriosclerosis may play in such conditions.

Kraepelin,⁹ in his earlier descriptions, did not give a clear picture of the chronic manic states except that he referred to a certain instability which might persist between attacks. In his latest edition, however, he has referred to the clinical descriptions given by Schott and has elaborated on these descriptions by cases of his own observation.

In the following eight cases, two somewhat ill-defined groups are observed. In the first group are cases which are chronic, but in which the intellectual activities are as keen and alert as ever. In the second group is found a certain degree of mental dullness and impaired mental activity as well as a chronic course. It should be stated that none of these cases show evidences of organic complications, such as senile changes or arteriosclerosis.

GROUP ONE.

CASES WITH CHRONIC OUTCOME BUT IN WHICH THE MENTAL ACTIVITIES SHOW NO APPRECIABLE IMPAIRMENT.

There are four cases belonging to this group. It may be seen that all have suffered from their mental illness for many years. In two instances there are exacerbations followed by quieter periods, but in these latter periods the manic features are still present. In one case the episodes occur in a circular course at times, and in another case there is continuous manic excitement.

CASE I.—This patient is now aged fifty-one. She has been at the hospital for eighteen years. She is regarded as a manic depressive case of chronic type.

Her father had numerous attacks of depression. One brother is very unstable and often depressed. Another brother is a chronic patient in a State Hospital and one cousin is a chronic patient at this hospital.

The patient is said to have been an intelligent child. She received a High School education and managed the household efficiently for a few years. Between the ages of fifteen and eighteen she was subject to mild attacks of depression of a few weeks duration. At the age of twenty she had an attack of marked depression and was in an institution for several months. After this she was subject to mild episodes of depression from time to time until the age of twenty-seven. At that time the attack was so severe that she was again taken to an institution, where she remained for several months. At the age of thirty she had a maniacal attack which lasted in varying degree for many months, and after which she never entirely recovered. She has been constantly in an institution since that time, except for a brief period at home with a nurse.

During eighteen years observation at this hospital the patient has been subject to irregular episodes of depression and excitement. On rare occasions during the first two years she was moderately comfortable for a brief period, the main symptoms at such times being a certain timidity and a rather natural anxiety about her health. The illness has progressed during all this time, and for the past seven years there have been no periods when she has approached the normal. During the depressed condition she shows the suicidal tendencies, the retardation, and the self-accusatory ideas of a typical depression. When elated she shows flight of ideas, distractibility, and great motor restlessness. These phases alternate in an irregular way. There have been no hallucinations and no delusional trends. Such intellectual functions as the memory, orientation, and general understanding are quite intact.

In this case we observe a continuous hospital residence of nearly twenty years, during which the course has been progressive. The case is the mildest of the series here recorded, but it appears that one is warranted in

regarding the condition a chronic one. The tendency toward instability in early adult life and the progressive severity of the symptoms are noteworthy features. The family predisposition is quite apparent.

CASE II.—The second patient of this group is at present sixty-seven years of age. She is a large, strong woman and shows no evidence of arteriosclerosis or senile changes. She has not been considered normal since the age of thirty-eight, and the duration of her stay in the hospital has been thirteen years. She is regarded as a chronic manic case.

The patient comes of a brilliant family, but one predisposed to mental disorders. One cousin committed suicide during an attack of depression. Another cousin was once a patient at this hospital, and still another cousin is Case IV of this series.

The patient's early life and mental condition previous to admission are not very well known. It is known, however, that when a young woman, and for many years, she was much concerned about her health and took a great deal of medicine. This hypochondriasis was often remarked by her friends. At the age of thirty-eight, as near as can be established, she had her first mental attack. Probably this was a period of depression, as the patient describes a condition of under-activity. From this time on it is doubtful whether she was ever again entirely well. She was in institutions most of the time. At other times she travelled about, talked much of her intimacy with high government officials and was pompous and boastful in her manner.

When admitted to this hospital she was talkative, boastful and full of plans. She wrote voluminous letters about various State matters. Throughout her stay of thirteen years at the hospital she has had exacerbations of marked excitement from time to time. During the quieter periods she remains boastful and full of plans. At no time does she become entirely normal. She is quite over-productive and circumstantial in conversation, engaging strangers and visitors in argument if opportunity permits. On rare occasions, and for brief periods only, she shows some under-activity, during which she sits quietly and talks little. It is then necessary to urge her to change her clothing, take her bath or attend to other necessities. There is no evidence of hallucinations and there is no delusional formation, unless her ever-changing plans and arrangements for the future are to be considered as such. The hypomanic picture is quite typical during her quieter periods and the acute manic picture is typical during the exacerbations. On these latter occasions she shows increased motor activity, talks constantly and is noisy day and night. Her mood at times is one of elation to which is added much ill temper. She is quite drifting in conversation and shows distractibility. The episodes subside generally without subsequent depression. It is of interest that at times the former hypochondriacal complaints appear.

It cannot be said that this patient in her psychosis shows anything other than a manic depressive reaction. The case is evidently a chronic one of at least twenty years duration. Probably an inherited constitutional tendency plays an important part.

CASE III.—The third patient of this group is now aged sixty-three. The attack has lasted for thirteen years, the psychosis having become manifest first at the age of fifty-one. Many eccentricities and mood changes, however, had been observed for years previously. The case is considered one of chronic manic excitement.

The family history is negative. The patient in early adolescence was given to displays of temper, a tendency which grew more marked as years went on. She was fairly efficient, however, in that she was capable in the management of her father's household from the age of fifteen to forty. At that time, when her father died, the patient lived with relatives, but appeared to be unable to adjust herself to this change in circumstances. She complained about imagined injustices and was generally disagreeable. Although subject to episodes of temper from time to time, the symptoms of the psychosis were not in evidence until at the age of fifty-one, seven years previous to admission.

At the onset she was depressed, and presented the usual picture of an agitated depression. She was agitated and self-accusatory. After some months this was succeeded by a period of under-activity with depression. After about two years she grew more active again and some improvement was observed. An irritable, scolding state followed, however, which probably was part of the subsequent manic excitement.

On admission, five years ago, she showed a typical manic picture. There was constant flight of ideas and distractibility, and this was accompanied by an irritable, rather than elated, mood. This condition has continued until the present.

At present the patient continues in this disturbed condition month after month. If left by herself she sits quietly and reads a little occasionally. She cannot be induced to do work of any kind. If one tries to engage her in conversation she at once grows excited and begins to shout. She plays on words, rhymes some, and always shows quite typical flight of ideas. She often laughs, but in a harsh, emotionless sort of way. As she grows more disturbed she stamps about and follows one to the door. She will not answer questions always, but from what she says it is evident that she is quite clear as to her environment and that her memory is good. In no way does her condition differ from the usual manic picture, except that her mood seems somewhat unnatural.

The patient has gone on in this way, without change, for five years. Her conduct is quite unvariable and monotonous. No delusional trends have developed. There are no evidences of organic change in her physical or mental condition.

In this instance it is quite apparent that the psychosis of thirteen years duration is of manic depressive type. It has arisen in an individual strongly predisposed by constitution. In view of the unvariable, monotonous course and of the constitution of the individual it appears to one that any marked improvement is quite improbable.

CASE IV.—The fourth patient in this group is much younger than those preceding, being now about thirty years of age. The course, however, has already been for fourteen years, as the onset was at the age of fifteen. In view of the fact that the onset was at puberty and that the duration has been fourteen years, one would be inclined to think the case one of dementia præcox. The history and symptomatology, however, indicate a manic depressive reaction.

The patient is a cousin of Case II. She has a similar family history. She was always a somewhat sickly child, and as she worried about her studies she discontinued school entirely at the age of fourteen. She was not at all mentally deficient, however, and was attractive as a child.

At the age of sixteen she had an attack of typhoid fever, after which her physical condition was poor. A depressed state of insidious onset started two years later. She was despondent, refused food, and appears to have been much retarded in all her activities. This condition lasted for two years.

After this depression the patient gradually grew over-active, elated and talkative. From this state of activity she has never entirely recovered. At times she has been very disturbed. At other times she was slightly over-active only and was well enough to engage in outdoor sports with a nurse.

On admission, during one of the excited periods, she was elated and showed much motor activity along with flight of ideas and distractibility. The condition was one of manic excitement of moderate degree. There were no evidences of hallucinations or of delusional ideas. Her memory and orientation were quite clear throughout.

At present the patient is in an under-active condition, as is usual after the excited period. If left by herself she sleeps much of the time. She is not at all depressed, however, and when conversed with she makes witty and playful remarks. She is quite intelligent and alert in conversation. The psychosis for ten years has consisted of exacerbations of manic excitement, followed by periods of under-activity in which the manic features remain.

When we consider the constitutional weakness in the emotional sphere of this patient, the character of the prolonged course, and the present condition, it seems very probable that the case is a chronic one quite similar to the first two described.

In reviewing these four cases, numerous eccentricities and constitutional abnormalities are quite apparent. The deviations are mainly in the affective reactions, as is shown by the emotional instability and the excessive mood changes. In most of the cases, after a number of mild attacks, the final attack developed, after which recovery did not take place. A permanent psychotic state is represented in this terminal condition, and a more normal level does not seem possible. It is of interest, however, that this second level is maintained without further change.

Some features of the symptomatology are of interest. One

observes that the clinical picture has changed very little from year to year. As a rule, the acute attacks are no longer circumscribed, and the elements of the manic state are present in the intervals, as well as during the exacerbations. The tendency toward chronic excitements seems more marked than that toward chronic depressions, although in other cases chronic depressions have been observed.

GROUP TWO.

CASES WITH CHRONIC COURSE AND WITH CONSIDERABLE MENTAL DILAPIDATION.

The following four cases show a more severe type of the disorder than the above, in that in these latter cases a considerable degree of mental dilapidation has followed in the course of years. In some instances, one would feel, on casual observation, that marked deterioration had occurred. Closer observation, however, shows that there is more alertness than one would expect, and in most cases the residuals of the former manic states are present. At times in these cases there is some incoherence of speech, and in some instances very few manic features are now demonstrable.

CASE V.—The first case of the second group is a woman aged fifty-four. The psychosis has lasted for ten years. Numerous eccentricities were observed for ten years previously. The prognosis appears quite unfavorable and a certain degree of mental dilapidation is present.

The family history is negative, except for alcoholism in the brothers. As a young woman the patient was clever and received a fairly liberal education. She was regarded as the most intelligent of a large family. At the age of thirty, the first change was noted in her disposition. The father states that she became a crank on the subject of religion and she grew quite eccentric, in that she was very headstrong and difficult to advise. For about five years before admission she had several mild attacks of depression.

On admission, ten years ago, she was in a maniacal state. This lasted in an extreme degree for several months. She was then somewhat stupid and dull for a short time, but soon reached a comparatively normal condition. While in this state she was on the convalescent hall and was quite natural in all respects. Her discharge was considered unwise, however, because of emotional tendencies on slight provocation. During the next two years she had recurrent attacks of manic excitement, followed by normal periods. The manic condition was in all respects quite typical.

In the course of time the clinical picture had undergone gradual transformation. For the past seven years this change had been observed. At

first she did not entirely recover from the manic state. During the quieter periods she grew very reserved and refused to discuss her symptoms. At the same time the former interests which she had had in life no longer entertained her. She became constantly so ill-natured and irritable that she could no longer be on the convalescent hall.

The present condition has been in evidence for several years. She is now subject to over-active periods from time to time, followed by quiet intervals. During the active period she is silly in conduct, making rather childish remarks, but at the same time she shows considerable elation with motor activity and flight of ideas. Her productions are limited to a few often-repeated topics of everyday occurrence. These exacerbations are ill-defined and gradually drift into quieter periods.

At this latter time the dilapidation is particularly apparent. She lies about by herself and dresses in a most slovenly way. She takes no interest whatever in what goes on about her. When addressed she often indulges in obscene language. She will not do work of any kind and her conduct and manner are such as would lead one to think her quite dilapidated. All this appears quite independent of any mood change.

On rare occasions her conduct improves to some extent. At such times she is not very accessible and appears angry or offended if one wishes to discuss her symptoms. The condition of her memory is difficult to test, but there is considerable to indicate that there is no impairment. There are no organic findings.

We observe in this case that while the symptoms were quite typical in the beginning, a definite change in the clinical picture has taken place. The residuals of the manic excitement are observed at times, but a considerable dilapidation of progressive character has occurred. This latter is mostly in the higher intellectual spheres. When quite free from other symptoms the interests and activities of her early life are entirely lacking. In contrast, she has grown very slovenly in manner, narrowed in interests and quite dilapidated in conduct. It is of interest that the onset of the severe symptoms were at the same time as the menopause at the age of forty-four.

CASE VI.—The second patient of this group is sixty-four years old. She has been in the hospital for seven years. She shows considerable mental dilapidation now, subsequent to previous manic attacks.

The family history shows that one brother was insane and one sister also had some mental disorder. The patient's son, now a mature man, had a recoverable mental attack.

The patient received a fair education and there was nothing unusual in her early life. Eccentricities were first observed at the age of seventeen. She began then to have temporary periods of ill temper of a few days duration. She was married at the age of twenty-one and about a year later, which was subsequent to child-birth, she had what was probably a manic attack of four months duration. She recovered and was well for ten years. During this period she gave birth to five children. It is stated that her husband was unkind to her and that this caused her continuous worry and distress.

At the age of thirty-three she had a typical maniacal attack of two years duration. She recovered, but soon after returned to the hospital and probably was not entirely normal, as she remained for a year. At the age of thirty-seven another child was born and again she had an attack. This lasted, with short intervals, however, until the age of forty.

From the age of forty, until her admission here, seventeen years later, at the age of fifty-seven, she was comparatively well. During all this time, however, she was somewhat unstable. For example, she would exaggerate upon what she had read in the newspaper. When told of this she would grow embarrassed and try to explain it away. She was somewhat more unstable during the menopause, four years before admission.

On admission, seven years ago, she first appeared confused and partially delirious. In a short time, however, she showed over-activity and her utterances were typically manic. She was distractible, with elation and flight of ideas. In this setting, however, there were some distorted utterances about religious topics.

Throughout the patient's stay at the hospital the clinical picture has undergone considerable transformation. At first she was very active and quite typically manic. She gradually grew quieter and her elation seemed somewhat artificial. Later she lapsed into a muttering, scolding state, in which she was very slovenly and showed much indifference.

At present she sits about very quietly. She says little and is at times untidy in dress and uncleanly in habits. She is often found muttering and scolding quietly to herself. Although somewhat over-active, she is never depressed. Her conversation consists of short, disconnected sentences, but when spoken to she always grows talkative and then shows a typical flight of ideas. There is no evidence of hallucinations or of delusional ideas. As near as one can judge, her memory is quite intact. She is subject to periods of over-activity of short duration from time to time.

We observe that this woman showed some eccentricities before the age of twenty. She had several manic attacks and did not quite recover after the age of forty. The present episode, coming on at the age of fifty-seven, has left her somewhat dilapidated mentally, but at the same time some manic features remain. The lack of interest, the slovenly conduct, and the general indifference, independent of affective lowering, are noteworthy features.

CASE VII.—The next case of this group is also aged sixty-four. She has been under observation for fifteen years. The clinical picture during this time has undergone considerable change, and at present she is quite inaccessible.

The family history is negative. The patient received a common school education and was a clerk in a small store for some years. She was always reserved, retiring and considered slightly peculiar. She led a solitary life and had few friends.

At the age of thirty-seven she had an attack of depression from which she recovered after one year's hospital residence.

At the age of forty-nine the present psychosis started. Before that time she had been somewhat more irritable and difficult to get along with than formerly.

On admission, which was a few weeks after the onset, she showed an agitated depression, such as is often seen in the involutional period. She was restless, sleepless, and bit her nails constantly. She said she had committed the unpardonable sin and wished to die.

This condition continued for about two years. Then a gradual change took place. She grew irritable, struck other patients, and talked in a scolding, harping sort of way. She gradually became dull to superficial appearances and was under-active. At one time she stated that her brain did not act properly and at the same time she said that she was poorly dressed.

It cannot be said just when the change to her present state occurred, but apparently there has been a gradual transformation during the past several years. At present she is under-active, and at first one would think her quite demented. She sits quietly all day, but is constantly talking in a muttering voice, keeping up a constant comment on what she sees or hears. Her productions are quite definitely manic. She is easily diverted and quite distractible. She interposes a few witty remarks and plays on words. She laughs at times in a hollow sort of way. She takes food from the other patients if allowed and strikes at the nurses when annoyed. As a rule she is quite inaccessible, but her orientation is clear and her memory is good in such respects as can be tested.

In this instance we see a rather unusual condition. There are some unmistakable manic elements, but in a setting of what appears to be a rather dilapidated mental state. The general lack of interest, the narrow scope of the mental activity and the willful, irritable conduct suggest a certain degree of deterioration. It is of interest that the onset was at the involutional period and it should be emphasized that she was always a somewhat eccentric individual.

CASE VIII.—The last patient to be described is now sixty-seven years of age. Despite her advanced years she shows no evidence of senile changes in her mental condition. She has been at the hospital for seventeen years and is considered a manic depressive case of chronic course, with some subsequent deterioration.

One brother was alcoholic. The patient was normal in her life and received a fairly liberal education. At the age of thirteen, just before the onset of menstruation, she had a mental attack of several weeks duration, the exact character of which is not known. She recovered entirely and was married at the age of twenty-three. She has three healthy children, who are now of mature age.

At the age of twenty-eight she had a second attack. This lasted for fourteen months. Her condition then was said to be similar to the final attack about to be discussed. At that time she was said to be both depressed and excited.

She entirely recovered from the second attack and was well until the onset of her present illness at the age of fifty. During this interval period

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She entirely recovered from the second attack and was well until the onset of her present illness at the age of fifty. During this interval period

of over thirty years she was quite well and very efficient. She cared for her home, taught music and was considered normal in all respects.

The present attack began at the menopause, age fifty. At first she was agitated and depressed. She spoke of herself as the evil one and thought people were telling her to dash out her brains. Before admission she grew elated and talkative and was extravagant in her purchases.

The patient has been in the hospital for seventeen years. The daughter who visits regularly says her mother has never been normal since admission. At first she was restless, active and elated, and in a manic state. Her productions always appear to have been somewhat peculiar, however. She spoke somewhat incoherently of being a bride—she was "Lord Jesus Christ, able to preserve humanity."

The course of the illness has been of cyclic character. At times during acute exacerbations she has been very disturbed and over active. After several weeks this subsided, to be followed by a period of under-activity. During this latter state she does not become very clear mentally.

At present the exacerbations of excitement continue to occur much as in former years. She seems somewhat dilapidated, but very definite elation with a somewhat grandiose coloring is present. Certain indications of distractibility and flight of ideas still exist. There also appears to be some incoherence, of which the following productions are fairly typical. Approaching the examiner she says: "Are you going to give me a kiss this morning. Did you get a letter from Charles? I know you, ha, ha." Continuing she says: "I pass more than I urinate. Do you use the word urinate. Rubadubb dubb; three men in a tub. I am not acquainted with Dr. P. I am an elegant sewer. Why don't you tell all the world Aunt Sally is not a good sewer. You need not put on airs, I can write (sees notes). I never kiss you. They are so afraid," and so she continues. At such times she is restless at night, does her hair fantastically and ties her clothing about her.

During the quiet period she is more composed and dresses neatly. She remains a little grandiose, however. She maintains that she is an elegant singer. She says she is married to the doctor and then adds, "that is a joke." She writes short letters to her daughter, dating and addressing them properly. Her orientation is quite clear and probably her memory is unimpaired. At the same time she says: "I am the Deity; I am a bride; there is always a bride in the Bible; I am the Lord Jesus Christ."

It is quite evident that the above condition is one of considerable dilapidation. It has little in common, however, with what we recognize as senile changes. At the same time, in a somewhat altered way, certain manic elements remain in evidence. The course is clearly a chronic one and the dilapidation is quite marked. No hallucinations are demonstrable and there is no definite delusional formation.

In this instance we see an end result which is quite unusual. The case differs from others somewhat in that the patient was considered normal and efficient and showed no constitutional eccentricities. The distortion of the utterances, while in manic setting, is more marked than in other cases.

In considering these eight cases it is seen that they have much in common. We find that we have to do with an exceptionally severe type of manic depressive reaction. In most instances it occurs in individuals definitely predisposed by heredity and constitutional makeup. The deficiency is mostly in the emotional sphere, as the mental endowment is generally excellent in other respects.

It is seen in some instances, that after a few mild attacks in early life, the normal level is no longer reached, and a permanent psychotic state remains. This latter level may be maintained with little change over a period of many years.

In the more severe cases, there is a change in the clinical picture in time, and a certain kind of deterioration is observed. This latter state is usually marked by a narrowing of the usual interests and activities of life. The condition is in a way comparable to the dilapidation at times seen in epileptics, and possibly arises on a somewhat similar basis.

In most of the cases, as has been mentioned, the importance of heredity and constitutional tendencies cannot be denied. It is unsatisfactory, however, to accept this as the entire explanation of these exceptionally severe types. In order to establish more definite causative factors, careful observation is necessary at the onset, when precipitating factors may be better understood. Unfortunately, this has not been possible in these cases. A study of similar cases, with this object in view, would doubtless add to our knowledge of such conditions.

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CLINICAL AND ANATOMICAL ANALYSIS OF 25 CASES
OF MENTAL DISEASE ARISING IN THE FIFTH
DECADE, WITH REMARKS ON THE MELAN-
CHOLIA QUESTION AND FURTHER OBSERVA-
TIONS ON THE DISTRIBUTION OF CORTICAL
PIGMENTS.*†

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* Number 40, Danvers State Hospital Contributions.

† Read in abstract at the sixty-ninth annual meeting of the American
Medico-Psychological Association at Niagara Falls, Canada, June 10-13,
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I. INTRODUCTION.

It is well to say at the outset of this communication that the facts presented—in either of the two main lines of consideration—cannot be fully understood until a similar analysis has been made of those insanities arising in previous decades. The two main lines of consideration are these: (1) an attempt to describe the chief clinical features of mental disease arising at different epochs in life and in some sense *genuinely* characteristic of said epochs, and (2) an attempt to secure a histological basis for metabolic changes and age-changes as shown in the distribution of certain special pigments in various types of cell (nerve-cells, neuroglia-cells, perivascular phagocytes) in subjects of different ages, as modified by the occurrence and duration of various mental diseases.

Both of these inquiries have been sketched in previous work from the Danvers laboratory. With H. W. Mitchell, one of the present writers (E. E. S.) read before this association in 1908 a paper entitled "Clinical and Anatomical Analysis of 23 Cases of Insanity Arising in the Sixth and Seventh Decades with Especial Relation to the Incidence of Arteriosclerosis and Senile Atrophy and to the Distribution of Cortical Pigments." Of course there is no reason to suppose that a division of human life into decades has any ultimate value as the basis of grouping morbid entities. But there is as yet lacking any other age-division superior to the decennial division, and it is clear that, if a complete analysis of a sufficiently large material from all the decades be made, no case-types will escape investigation and a picture of progressive disease-liabilities varying with age can be drawn. In point of fact, Southard and Mitchell had in a paper¹ preceding the one mentioned above (Melancholia with Delusions of Nega-

tion: three Cases with Autopsy) tried to investigate what has proved to be the main topic of the present paper, viz., involution-melancholia, by choosing cases on ordinary clinical grounds and endeavoring to decipher their cortex-histology. But the necessity of a broader field of view became at once apparent, particularly when we came to consider the distribution of pigments there studied.

But, although we had begun with clinical differentiae (Cotard's syndrome) and desired to work especially on the cortex-metabolism (so far as histologically workable in the pigment field) in involutional insanities, we found that we had first to clear away the difficulties of the senile and subsenile period. In effect in their second paper,² dealing with insanity arising between 50 and 70, Southard and Mitchell felt that those senile and subsenile difficulties had been at least in part resolved. We stated categorically, on the basis of that study, that

neither old-age changes nor arterial disease have any necessary connection with the development of insanity in the later years of life, at least in the sixth and seventh decades. It seems probable that *arteriosclerosis*, *senility*, and various forms of *insanity*, are entities which frequently interpenetrate, but are logically and genetically quite separate.

We were thus better prepared, as it were, to *climb down* from the senium and the subsenium to the still more obscure level of the pre- and post-climacteric in women and to the possibly allied difficulties in men as shown in the fifth decade (mental diseases arising from the 41st to the 50th year inclusive).

We need not rehearse in this introduction the tentative conclusions concerning pigment-distribution presented in either of the previous papers, but will speak further of them in our conclusions. They do not necessarily concern, either to strengthen or to invalidate, our clinical studies, but form a separate branch of biological inquiry taking their rise in the neglected field of Bevan Lewis (1890).³ The work has been stimulated by the recent lipoid work of Alzheimer,⁴ although his special methods have not been employed. We have dealt as before with certain pigments or pigment-like bodies brought out by the iron-hematoxylin method of Heidenhain.

We first present a condensed analysis of the total material from which our special material has been chosen, follow with casuistic

analyses in the chosen series, and conclude with separate sections on the special and general problems touched.

II. THE GENERAL DISTRIBUTION OF DISEASE FORMS IN THE FIFTH DECADE MATERIAL.

From 871 consecutive autopsies (Danvers Series, No. 729 to 1600) we selected those in which the onset of the first mental trouble came in the fifth decade.

TABLE I.—MATERIAL.

No. 729 TO 1600 OF D. S. H. AUTOPSIES.

Consecutive autopsies	871
Onset of insanity at 41 to 50.....	124
General paralysis	62
Syphilis of brain	2
Tumor	6
Meningitis 1, septicemia 1, central neuritis 1.....	3
Other coarse brain lesion; introductory shock..	9
Alcoholism	12
No history	5
<hr/>	
Total ruled out.....	99
<hr/>	
Leaving for consideration.....	25

A group distinguished by lack of all the above factors (the above factors are not peculiar to this decade).

We found that we had to deal with 124 cases arising between the ages of 41 and 50. Of these 62 were general paretics. There were two with cerebral syphilis, and six with cerebral tumor; one with central neuritis; one with meningitis; one with septicemia. These groups, 58 per cent, were laid to one side, with the feeling that not among them could the special characteristics of any decade be found. Five cases where no history could be found were added to these, leaving us with three groups, an alcoholic group, an arteriosclerotic group, and a remainder.

The alcoholic group of twelve cases we set aside because of the difficulty in locating the onset as well as on the supposition that here also little would be found of special interest for our chosen decade.

And lastly we separated out a group of nine cases where arterial disease was evident at the outset. Seven of these cases were post-apoplectic, one followed cerebral aneurism, and one began with hour-long periods of unconsciousness, convulsive attacks, death with gangrene and cerebral softening. With some reluctance we postponed the study of this group, but with the feeling that the cerebral insult masked the facts we were seeking.

Our remainder was found to consist of 25 cases which probably were associated neither with gross brain lesion nor with alcohol. Here, if anywhere, would lie the essential characteristics of psychoses of insanities arising in the forties. (See Table I.)

III. MATERIAL AND METHODS.

The special requirements of our investigation prescribed the material and methods used. We have, so far as possible in each case of the group chosen as above and described in brief in Section IV, considered carefully the following features:

(a) The *clinical history*, with especial reference to the age and character of onset (having practical prognosis particularly in mind), in women the relation of menopause to onset, and in all cases the duration of life and of mental symptoms.

(b) The *general autopsy findings*, as witness of general or special *metabolic disorder*, or *agonal or recent changes*, and of disorder of glands of *internal secretion*.

(c) The *condition of the gross brain*, as to the occurrence of softness, induration, atrophy (diffuse or focal), sclerosis, other focal lesions, and arteriosclerosis. With respect to the latter it will transpire that some few cases which gave no evidence whatever in the gross of arteriosclerotic disorder, exhibited extensive and important microscopic changes. These cases are duly noted below.

(d) The *condition of the brain cortex*, studied microscopically. The work here has no pretensions whatever to completeness and simply attempts to rule out or consider with particular care those cases where stains for *cell-topography* (e. g., a monochromatic methylene blue stain) exhibit cell losses. Particular care was taken to consider the occurrence of changes reminding one of those in senile dementia and in dementia præcox. No special study of the occurrence and distribution of the Redlich-Fischer

plaques has been undertaken for the present purposes. It is hoped to consider these lesions in a later communication in which the findings of the present paper can be correlated with those of Southard-Mitchell (1908).

(e) The *presence or absence and amount* of certain substances, here called *pigments*, demonstrable in the cortical cells by Heidenhain's iron-hematoxylin method after 95 per cent alcohol (or less advantageously) formaldehyde fixation. These have been studied in (1) *perivascular cells*, presumably i., as a rule about the larger vessels in cells of mesodermal origin (phagocytes), but ii., about some at least of the smaller vessels in cells of neuroglia type which resemble, if they are not identical with, satellite cells; (2) *neuroglia cells*, both in subpial layer and white matter and in the cortex-layers (satellite and other neuroglia cells); (3) *nerve-cells* of various types.

Remarks are offered in conclusion as to the possible significance of the quantitative and topographical variation of these iron-hematoxylin demonstrable lipoids. The study was conceived for the purpose of securing data concerning cortex-metabolism, using simple methods.

IV. CASE-MATERIAL.

CASE I is a married woman who had her first attack at 48 and died at 66 after four admissions to this hospital.

Her family history was negative.

At 48 she was apprehensive, suicidal, and had auditory hallucinations. Physical examination was negative. She was discharged as recovered.

On her return at 52, violent, agitated, depressed, it was noted that the menopause had been passed, but the exact time is left indefinite. After a period of sullenness, she became elated, then depressed again—always there was a trace of confusion. She showed exophthalmos and a very irregular and feeble heart. Again discharged as recovered.

At 56 she returned in an apparently manic confusion; she was cheerful and apprehensive by turns, and hallucinated. There was distinct exophthalmos, a pulse of 84, without enlargement of the thyroid; a tuberculin test was positive; albumen appeared in the urine. Discharged as much improved.

At 65 she appeared senile, dull, incoherent. She showed a great memory defect. Her heart skipped one beat in ten; there was much albumen in the urine. At 66, right sided shock with coma, death in two days (fever 102 at the time of shock).

AUTOPSY.—*The cause of death was cerebral hemorrhage.*

The brain weighed 1200 grams, and its substance was edematous. The basal vessels showed no sclerosis. The dura was everywhere adherent. The pia mater showed a slight general thickening, especially along upper border of cerebellum (spots of acute leptomeningitis). There was a hemorrhagic infiltration of the substance of the head of the left caudate nucleus and anterior third of the left internal capsule. (Staphylococcus pyogenes grown from area of hemorrhage.) Whether this was an area of encephalitis or a basal hemorrhage with invasion by staphylococci is doubtful.

ANATOMICAL DIAGNOSIS.

Hemorrhage in caudate nucleus and internal capsule (left).
Acute purulent pericarditis.
Acute purulent bronchitis.
Broncho-pneumonia.
Diploe densely congested.
Slight chronic leptomeningitis.
Marked external pachymeningitis.
Uterus much atrophied; many small fibromata.
Ovaries greatly atrophied.
Coronary and basal vessels smooth.
Aorta slightly thickened; a few small plaques.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation slight or absent.

Neuroglia cell pigmentation moderate to marked universally in nerve cell layers, less in plexiform layer.

Nerve cell pigmentation variable within small areas, moderate to excessive in degree.

Nissl picture shows cellular gliosis of white matter and plexiform layer, moderate variable or absent satellitosis in nerve cell layers. Foci of cell destruction, apparently of a globular shape, without especial neuroglia reaction, characteristic though infrequent in layers of large external and medium-sized pyramids (frontal, occipital). Occasional large external pyramid caught in process of destruction with satellitosis. Edema changes in various layers, especially supragranular nerve cells in occipital sections.

CASE 2 is a single woman whose mental illness began at 42, when she was brought to the hospital where she remained the rest of her life, dying at 50.

One of her sisters had fits. The patient had been a cheerful person of ordinary mental capacity.

During the menopause, at 42, she spent all night at the beach, "to hear the waves." The next morning she began to complain that an ointment had caused sickness everywhere, that bells and all street-cars had stopped because of it. Upon her entrance to this hospital a month later she still smelled the ointment "which had ruined the town"; "everybody in Lynn

was afraid to go out"; she could hear the cries of her family who were being murdered. She was clear; her memory was good. The menses were irregular, she had hot flashes, the uterus was atrophied, there was a pustular eruption on back, chest, arms, fingers. After 3 months considerable albuminuria. In nine months a marked exophthalmos was noted, with a fine tremor, and pulse of 120, but no apparent thyroid alteration. In a year after admission she said that she was to be judge of the world. A little later a tuberculin test is reported as positive. Eighteen months from the time at which they were first noted, the exophthalmos and tremor had almost disappeared and her pulse was 90; her memory was good; "she did everything wrong." A general physical examination in the 7th year of her residence showed her condition as good.

ANATOMICAL DIAGNOSIS.

Disseminated tuberculosis of both lungs.
Chronic obliterative pleuritis.
Tubercular ulcers of ileum and caecum.
Chronic gastritis with healed ulcers.
Multiple thromboses of iliac and pelvic veins.
Atrophic liver (wt. 805 g.).
Chronic splenitis (wt. 35 g.).
Chronic diffuse nephritis.
Chronic myocarditis.
Slight mitral sclerosis.
Emaciation.
Ovaries atrophic.
Chronic external adhesive pachymeningitis.
Chronic leptomeningitis of vertex and cisterna.
Compensatory edema of pia.
Atrophy and sclerosis of frontal and central regions.
(Aorta, coronary and basal vessels smooth.)

AUTOPSY.—The cause of death was pulmonary tuberculosis.

The vessels of the base of the brain and elsewhere were of normal appearance. The dura was adherent to the calvarium at the vertex. The arachnoidal villi were moderately developed, particularly over the left central convolutions along the longitudinal fissure. The pia mater showed thickening over the veins in the neighborhood of the arachnoidal villi, and in the walls of the cerebellar cisterna, but nowhere else. The pia of the frontal poles and central regions of both sides contained considerable compensatory edema. The brain showed some variety in consistence, the frontal and central regions having most resilience, but was in general less firm than usual and suggested post mortem (30 hours) imbibition of water. The grey matter showed considerable pigmentation, especially of the vertex. The cerebellar laminae are slightly thinned out, most markedly in the clival and cacuminal regions.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation moderate, more variation than usual in that the precentral tissue on both sides showed very little as compared with other areas examined. Some pigmentation of *endothelial cells in situ* in the left frontal region.

Neuroglia cell pigmentation moderate and universal in satellite cells of all layers (less in precentral gyri).

Nerve cell pigmentation not much in evidence except in the calcarine regions (more especially left) where there is considerable pigmentation, especially of the cells of the supracerebellar layers.

Subpial fibrillar gliosis, especially calcarine. Nerve cells well preserved. Whether the development of arachnoidal villi on the left side can have anything to do with the greater pigmentation on the left side cannot be said. No special study of the convolitional pattern or of differential weights was made; it seems hardly possible to account for the differences on the two sides on a vascular basis. Perhaps we have caught a progressive unilateral atrophy in process. It must be remembered that certain dementia præcox studies indicate that the left cerebral hemisphere is somewhat more subject to anomaly than the right.

CASE 3, a married woman, was admitted to this hospital at 50, recovered in eight months, was well at home for 24 years, and again came to this hospital at 73 to die in three weeks.

Her grandparents are reported normal, and her father. The mother, however, never recovered from an attack of melancholy which began at 48, and the only brother began to drink heavily when over 50. A maternal aunt was a senile dement. The patient herself was sensible, frank, cheerful, except for short spells of blues all her life. She had two children who are living and well, the youngest 35; menopause in late 40's with no mental symptoms. Development of right forearm arrested at three or ten years. At 49 received a burn which kept her in bed about a year.

At 50 she became depressed, hypochondriacal, suicidal, and was brought to this hospital. Soon recovering, the 24 following years found her "perfectly well both mentally and physically." In May, at 73, she was again restless and depressed, thought of suicide. In June, physical examination at this hospital showed a hardened radial, no tremor, a deformity of the right hand and arm (scar of burn), steadiness in Romberg's position, a right pupil slightly larger than the left. She was clear, apprehensive, self-accusatory, with flight: "I can't shed a tear," "my head feels as if it would burst," "are you going to cut my head, my arms and my legs off?" Symptoms of hemorrhagic cystitis appeared suddenly.

ANATOMICAL DIAGNOSIS.

Acute proctitis.

Acute metritis.

Hemothorax.

Chronic interstitial nephritis.

Arteriosclerosis of aorta, iliacs, coronaries, cerebral arteries.
Slight valvular endocarditis.
Hypertrophy of heart.
Much epicardial fat.
Chronic interstitial pancreatitis.
Chronic hepatitis.
Atrophy of spleen and stomach.
Lymphnoditis, retroperitoneal.
Cholecystitis, cholelithiasis.
Ulcer of colon.
Chronic interstitial fibrosis of lung.
Fibrous obliterative pleuritis.
Atrophy of mammary glands.
Central softening of adrenals.
Unequal pupils.
Frontal endostosis.
Subpial edema.
Clot in longitudinal sinus.
Chronic sulcal leptomeningitis.
Frontal gliosis and atrophy.
Temporal encephalomalacia (four hours post mortem).
Cyst of softening of left internal capsule.
Atrophy right lateral column.
Softening in sacral region of cord.
Dislocation of right wrist.
Arrested development of right hand.
Inequality in length of legs.
Anomalous ureter.
Anomalous blood supply of left kidney.

AUTOPSY.—*The cause of death was hemorrhagic cystitis.*

In connection with the brain findings, certain points need especial note: *endostosis of left frontal bone* near frontoparietal suture with erosion of corresponding dura mater and *maldevelopment of right forearm* (arrested probably at two to three years), with flaccid semiflexed hand and flexed fingers. The brain showed a small *white softening* (1 cm. in diameter) in the anterior portion of *left internal capsule* (no microscopic evidence of degeneration in the pyramidal tracts, examined in their passage through the bulb). *Bifrontal atrophy and sclerosis. Moderate internal hydrocephalus.* Brain weight 1195 grams. (Should weigh by Tigges' formula 1305 grams.) *Temporal lobe tissues soft.* (Microscopic examination showed marked edema changes, probably post mortem.) Unusually marked basal cerebral arteriosclerosis which microscopic examination indicates was part of a highly generalized process throughout the small vessels of the brain.

MICROSCOPIC EXAMINATION.

Nissl pictures show everywhere cellular gliosis of white matter and (marked) of plexiform layers. Generalized moderate perivascular cellular gliosis.

Considerable satellitosis, especially about large supratellate layer cells on left side, highly marked on right side. Nerve cells much closer together on left side than on right in the superior frontal and precentral regions, not so in superior temporal gyri, conditions seem reversed in the calcarine sections. *Vessels* unusually *thickened* everywhere.

A special study with other methods would be necessary to determine whether the closely packed cells of the right pre-Rolandic sections mean aplasia or early loss (compare the maldevelopment of right arm and the endostosis of left side of cranial vault).

From the point of view of the present study, suffice it to say that there is little pigment of any kind in the Heidenhain sections except in the calcarine areas where especially the neuroglia cells are often somewhat heavily pigmented (more on left than right).

CASE 4 is a single woman who had her first mental illness at 47 and who died at 67, after 17 years hospital residence.

Her sister was insane. The patient from infancy had a paralysis of the left leg. She became a school teacher. The menopause was passed at 45 with insomnia, loss of appetite, pain in the head. She was subject to attacks of indigestion.

At 47 she came to an acute depression with recovery. At 50 she again was depressed, self-accusatory, suicidal, confused, dizzy, constipated, deaf. At times she claimed that "the dead were alive," "food was poisoned," "great estates were hers," "hands had grown to an immense size."

ANATOMICAL DIAGNOSIS.

Malformation of both legs.
Scoliosis.
Atrophy of interossei of both hands.
Contraction of palmar fascia.
Chronic fibrous pleuritis.
Pulmonary edema.
Atelectasis of left lower lobe.
Enlarged peribronchial glands.
Ascites.
Chronic adhesive peritonitis.
Acute fibrinous peritonitis.
Cholelithiasis.
Dilated common bile duct.
Hyperæmia of small intestine.
Thickened capsule of spleen.
Atrophy of uterus.

Tumor of uterus.
Cirrhosis of liver.
Slight atheroma of aortic intima.
Chronic nephritis.
Adherent dura mater.

AUTOPSY.—*The cause of death was peritonitis.*

The brain weighed 1040 grams and the thickened calvarium 365 grams. The dura is diffusely adherent to the skull but its inner surface is smooth. The vessels of the pia mater are engorged. No further description of the brain is available.

MICROSCOPIC EXAMINATION.

Little material is available in this case. *Frontal* sections show little or no *perivascular cell pigmentation*, a moderate amount in the *satellite cells* of the nerve cell layers, and proportionally rather more in the *nerve cells*, especially the larger pyramids. Moderate *subpial fibrillar gliosis*. The white matter shows little evidence of change. Considerable satellitosis, rather more marked in infrastellate layers (not fusiform) than in suprastellate, and some collections of satellites indicating total destruction of nerve cells, probably large pyramids. The second and third layers show a fairly even disappearance of nerve cells. The microscopic examination, taken in conjunction with the brain weight (1040 grams, should be 1185 grams by Tigges' formula), indicates a process akin to that of senile atrophic dementia.

CASE 5 is that of a married woman who first showed mental derangement at 42, who was brought to the hospital in three weeks and died after a month's residence.

Family history is vague and negative. At 30 her lover committed suicide; at 39 she was married. At 41 a uterine cancer was discovered; it was twice curetted; she lost 50 pounds.

Three weeks before entrance she became unusually silent and depressed, said that she did not want to be a burden, was discovered hunting for carbolic acid "which I might want to use." She was taken to a general hospital, where she was restless, out of bed, annoying other patients, immediately after a meal complaining that she had had nothing to eat. Here she showed no interest in her surroundings and was mute. Riggs' disease was found on the upper jaw; the thyroid seemed of usual size; there was no palpable sclerosis; the uterus was enlarged, fixed, its cervix rapidly breaking down.

ANATOMICAL DIAGNOSIS.

Chronic nephritis.
Sclerosis, moderate of aorta, slight of mammaries, aortic valve.
Fibrous myocarditis.
Chronic ventricular endocarditis.
Infarct of kidney.

Carcinoma of cervix uteri.
Metastatic growth in pelvis.
Slight acute proctitis.
Few enlarged inguinal glands.
Emaciation.

Scaphoid abdomen.

Atrophic breasts.

Left adrenal soft.

Bruises of scalp.

Calvarium thickened.

Chronic adhesive internal and external pachymeningitis.

Slight chronic leptomeningitis.

Patent foramen ovale.

AUTOPSY.—*Cause of death was chronic nephritis.*

Head.—Hair long, black, heavy. Scalp contains a large amount of fat. On inner surface of left temporal a bruise 3.5 x 4 cm.

Calvarium.—Frontal measures 4 cm., temporal 2 cm., occipital 7 cm. Scalp eburnated. No diploe.

Dura Mater.—Slightly adherent to the calvarium externally and internally along the longitudinal fissure. No marked development of the arachnoidal villi.

Pia Mater.—Thin and delicate except over the vessels and sulci. In superior portion shows slight milkiess. Slight cloudiness in fissure of Rolando and over the pons. Slight subpial edema.

Basal Vessels.—Show no sclerosis.

Pituitary.—Firm.

Sinuses.—Walled with cruor clot.

Brain.—Weight 1240 grams. Pons and cerebellum weight 140 grams. The brain is practically symmetrical. Convolutions for the most part well rounded. Slight flattening of the pre- and post-central gyri of right side; also in the left prefrontal a slight depression approximately 1 cm. in diameter. Brain everywhere firm: resilient. No ependymitis.

Cord.—Not unusual.

Middle Ears.—Left shows slight opacity.

MICROSCOPIC EXAMINATION.

No evidence of nerve cell losses, unless slight sulcal fibrillar gliosis of both superior frontal regions be taken to indicate damage to the plexiform layer. *Perivascular cell pigmentation* absent. *Neuroglia cell pigmentation* absent or slight except in both *calcarine regions*, where it is *marked*. *Nerve cell pigmentation* absent or slight (notably also, slight or absent in calcarine regions).

CASE 6 is a married woman whose first mental sickness showed at 44; came to the hospital at 45 and died at 46 after ten months residence.

Maternal cousin was insane and a patient here.

Patient was married at 26 to a quarrelsome man, who, for the last four years before her entrance, was sick. The only child of this marriage died at birth and since that time the patient has been hypochondriacal. For the last year the menses have been irregular, she has had hot and cold flashes.

At first she began to worry because she couldn't keep up the house and couldn't sleep; wished she was dead; everything seemed twisted; she suffered from headache. A month before admission she got the idea that the factory hands where she worked were going to carry her off and do something dreadful to her. Two days before admission she said that there was no God, and that she must go out in the streets naked. After a day of talkativeness she became mute for a few hours. She said to the examining physician, "Everything is wrong. There is nothing to cover me, so I have said there is no God. My head is going round."

Here the only thing remarkable physically was dorsal flexion on the right foot and no response on the left. She was restless, oriented, had difficulty in speaking, was depressed; at times confused and hypochondriacal. She became untidy and showed marked cloudings of consciousness. At times she was mute for a month; at times she repeated the same word over and over. Three months after admission there was marked tremor and she masturbated. She was given injections of goat lymph and ovarian extract without noticeable effect.

ANATOMICAL DIAGNOSIS.

Acute enterocolitis.
Lymphnoditis mesenteric and chronic.
Lymph nodes of groin enlarged.
Slight hydropericardium.
Acute nephritis.
Acute fibrinous pleuritis right.
Acute fibrinous parietal endocarditis left and (slight) right ventricle.
Fatty kidneys.
Spleen enlarged.
Cholelithiasis with obliteration of gall bladder.
Calcification of lower costal cartilages.
Arteriosclerosis, aortic, basal, arch.
Unequal pupils.
Atrophic ovaries.
Atrophic breasts.
Malformation of os uteri.
Malnutrition and anemia.
Slight chronic leptomeningitis, focal.
Atrophy of gyri, prefrontal, second and third frontal.

AUTOPSY.—The cause of death was enterocolitis.

The brain weighed 1105 grams. The vessels at the base were slightly sclerotic. The pia was slightly opaque over the posterior frontal and cen-

tral regions and proximal halves of the Sylvian fossæ, clear elsewhere. The hemispheres were equal and roughly symmetrical. The gyri of both pre-frontal and second and third left frontal regions were small: the collateral sulci and the openings of the Sylvian fissure were deep and flaring. The anterior halves of both hemispheres suggest pigmentation: on the left the first temporal gyrus is lighter in color than the neighboring Broca area, but there is no difference on the right.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation everywhere even and very slight.

Neuroglia cell pigmentation moderate to slight everywhere. *Nerve cell pigmentation* little in evidence (Betz cells slightly pigmented).

No evidence of cell losses in areas studied, except that afforded by subpial gliosis (frontal, calcarine). The case deserves elaborate study from other points of view than those of this communication.

CASE 7, a married woman, who showed her first mental symptoms at about 46; came to the hospital at 59 and died about four months later.

Her mother was a senile dement. The patient was a normal child; hard working; honest. She was married at 33 and was always well until between 46 and 49, when the change of life came.

At this time she complained of being weak; thought there was something growing in her side; then grew physically weak for ten years. After this she made considerable mental and physical gains, and was able for three years to take charge of a small provision store. About a year before entrance she again became depressed and thought that she had a cancer; that her husband went with women; that people were stealing from her.

Here she showed edema under the eyes; regular weak pulse about 99; a heart not enlarged; arteries not thickened; a faint trace of albumen in the urine and many hyaline casts. She was tremulous and could not stand alone. Knee jerks and pupils were recorded as normal. She was dis-oriented, muttering, apprehensive, resistive, and expressed the idea that her food was poisoned. "O, I don't know much. They kept my brain and I didn't know they had changed the bed." Sometimes when touched she screamed as if in great pain; at other times pressure on the same spot brought no response. A month later irregular twitchings and muscular in-coordination, sound associations, slight distractibility, memory defect for recent events, some tendency to fabricate. After a second month auditory hallucinations were evident; she was roughly oriented; feared that 72 pieces of skin would be cut from her back. At the end of a third month she was oriented and stated that her fears were imaginary, but that she could not help them. She complained of pain in her rectum and feared it might be a growth. "People think her wicked but she has never done any wrong." She was afraid of a dungeon and terrible fumes. During the last month she grew very weak, complained of pain in the left side and abdomen, and had constant hallucinations.

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Lymphnoditis mesenteric and chronic.
Lymph nodes of groin enlarged.
Slight hydropericardium.
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Acute fibrinous pleuritis right.
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Arteriosclerosis, aortic, basal, arch.
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Slight chronic leptomeningitis, focal.
Atrophy of gyri, prefrontal, second and third frontal.

AUTOPSY.—The cause of death was enterocolitis.

The brain weighed 1105 grams. The vessels at the base were slightly sclerotic. The pia was slightly opaque over the posterior frontal and cen-

tral regions and proximal halves of the Sylvian fossæ, clear elsewhere. The hemispheres were equal and roughly symmetrical. The gyri of both pre-frontal and second and third left frontal regions were small: the collateral sulci and the openings of the Sylvian fissure were deep and flaring. The anterior halves of both hemispheres suggest pigmentation: on the left the first temporal gyrus is lighter in color than the neighboring Broca area, but there is no difference on the right.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation everywhere even and very slight.

Neuroglia cell pigmentation moderate to slight everywhere. *Nerve cell pigmentation* little in evidence (Betz cells slightly pigmented).

No evidence of cell losses in areas studied, except that afforded by subpial gliosis (frontal, calcarine). The case deserves elaborate study from other points of view than those of this communication.

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ANATOMICAL DIAGNOSIS.

Chronic mitral and aortic sclerosis.
Chronic perisplenitis.
Chronic appendicitis.
Chronic adhesive pleuritis, left side.
Chronic cystitis.
Renal lithiasis.
Slight arteriosclerosis.
Malnutrition.
Myomata of uterus.
Congestion of diploe.
Chronic pachymeningitis externa.
Slight subpial edema.

AUTOPSY.—*Cause of death was hypostatic pneumonia.*

The diploe was congested in patches in frontal and parietal bones. The pia over hemispheres and base was slightly edematous, clear and delicate. The basal vessels and their branches were free of gross changes, not conspicuous on section. The consistency of the brain substance was a little diminished; the convolutions rather plump.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation in general heavy (in this case some comparisons were made with spinal cord pigmentation: little or no perivascular cell pigmentation was found in several levels examined), perhaps slightly less in some areas of the right side.

Neuroglia cell pigmentation heavy in most areas, perhaps more marked in left side sections.

Nerve cell pigmentation more variable in amount than what the other cell types show. Also in certain areas *some of the cells* are much more heavily pigmented than others. In general more on the left side.

Nissl pictures show many small *vessels thickened*, considerable *subpial gliosis*, and an increase of neuroglia cell nuclei within the cortical layers of the frontal sections (but these are apparently developed along capillaries rather than next to nerve cells). Little or no satellitosis about nerve cells. In the paracentral regions there are considerable stretches in which both suprastellate and infrastellate large pyramids are absent; but there is no evidence of satellitosis about the surviving cells. The precentral gyrus, left, shows numerous areas of focal atrophy, involving suprastellate layers, but leaving the first and second cortical layers. The remnant of nerve cells in these areas of devastation indicate that the process of destruction is a simple atrophy; there is never any evidence of satellitosis attending this atrophy.

CASE 8 is a single woman whose first mental illness came on after the grippe and pneumonia, at about 49. She died after twelve years almshouse and hospital residence.

She had worked as cook; was cheerful; had good habits. Family history is unknown.

After her illness at 49, probably during the menopause, she became apprehensive, and soon developed auditory and visual hallucinations. Physical examination on her admission here showed a heart murmur and poor resonance over the right lung. She described her hallucinations quietly and intelligently. Later more emotional, she thought she was about to be killed. In three years she had gained much strength, and got into the habit of spending most of her time on a bench, scolding anyone who interfered with her. She was excitable, usually singing and noisy. After considerable improvement she was discharged to the almshouse at 54, and again returned to this hospital at 57, when she had a severe cystitis. At this time she was quiet when let alone, irritable when spoken to; disoriented, and said "I don't know" to everything. After several months in bed she developed erysipelas.

ANATOMICAL DIAGNOSIS.

Acute conjunctivitis.
Induration of skin of nose.
Acute hepatitis.
Acute parenchymatous nephritis.
Bronchopneumonia.
Epicarditis, acute.
Acute splenitis.
Myocarditis.
Chronic perisplenitis.
Chronic obliterative pleuritis,
Chronic interstitial nephritis.
Atheroma of aorta.
Valvular endocarditis, chronic.
Thrombosis of left ventricle.
Cavitation of apex of left lung.
Myoma uteri.
Unequal pupils.
Opacity of lens.
Chronic adhesive pachymeningitis.
Chronic leptomeningitis.
General cerebrospinal encephalomalacia.

AUTOPSY.—Cause of death was erysipelas.

Brain.—Hair, heavy grey. Scalp is unusually thick and contains much fat. Over the scalp about the roots of the hair are diffusely reddened areas, Temporal muscles are very small.

Calvarium.—Thin

Dura.—Fairly adherent to calvarium and the entire cranial wall. Is not adherent to pia. Pial vessels are deeply injected even to the finer branches.

Pia.—Is slightly milky along sulci. Pacchionian granulations along the longitudinal fissure. Pia is not adherent to the brain substance. Basal

vessels not remarkable. Brain weight 1085 grams. Brain is everywhere softened, especially at tips of frontal and the temporal lobes. There is a gaping of sulci in the parieto-occipital region of both hemispheres. Cerebellum and pons: weight 160 grams. The cerebellum appears softer than the cerebrum. No lesions noted. The pituitary body is softened and friable. Perforation of both ear drums.

Cord.—The pia is injected and cord unusually soft.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation moderate everywhere.

Neuroglia cell pigmentation moderate to marked everywhere.

Nerve cell pigmentation moderate everywhere. The left side sections seem to show on the whole less pigment, especially the left calcarine.

Nissl pictures exhibit marked focal vascular lesions among which figure dilations resembling those of *miliary aneurysms*, but there are no instances of hemorrhage and but few instances of focal glia reaction about the dilations. There is, however, everywhere a heavy neuroglia reaction which is rather even in amount in the white matter but is on the contrary focally very variable in the plexiform layer. The *left precentral gyrus* shows good examples of focal destructive lesions of a supratentorial distribution, as if excavated under a comparatively well-preserved second cortex layer. Numerous other focal lesions and devastations. The veins of the cortex and the spinal cord are often packed with polynuclear leucocytes (erysipelas). Lime deposits in hippocampal gyri and in spinal cord (no sign of pyramidal tract sclerosis).

This case teaches how occasionally the gross appearances are surprisingly deceitful. The subject gave no coarse sign of arteriosclerosis or other vascular disease except plaques on the posterior aortic wall and aortic, mitral and pulmonic endocarditis. Yet hardly any cortex section is without evidence of vascular disease.

CASE 9 is a married woman, first insane at 46, who died six months later, after four months hospital residence.

Her father was insane. She had one child before her marriage at 34, four afterwards. She is now at the menopause.

Two months ago she became worried because she had married a divorced man and wanted to leave her husband. She became sleepless and apprehensive, depressed, self-accusatory. On admission here her knee-jerks were slightly exaggerated, the right more than the left; pulse 60, regular and weak. She complained of feeling weak and unable to eat; thought the doctor was going to shoot her, and that her children were to have their hearts cut out. After three weeks she failed rapidly; got so weak she could hardly talk; said that her stomach was full, she could hold nothing in it; was tube fed.

ANATOMICAL DIAGNOSIS.

Pneumothorax.

Hydropericardium.

Purulent otitis media right side (tuberculous).

Passive congestion of liver.

Mesenteric lymphnitis.

Emaciation.

Atheroma of aorta, slight.

Granular ependymitis.

Brain weight 1260.

Constriction of stomach (6 cm. from pylorus, hour glass).

AUTOPSY.—*Cause of death was pulmonary tuberculosis.*

Brain weight 1260 grams. Calvarium shows a slight mottling of diploe. Dura and venous sinuses not notable. Pia clear and delicate over the hemispheres with delicate tracery of injected vessels. Basal vessels and cranial nerves not notable. Consistency of brain somewhat diminished. Convolutions full and with smooth surfaces. The ependyma covering the caudate nuclei and about the foramen of Munro is finely granular. Section of hemisphere shows rather conspicuous small vessels of cortex. Ependyma of fourth ventricle finely granular.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation slight except moderate in frontal section.

Neuroglia cell pigmentation marked, except gyri recti.

Nerve cell pigmentation slight.

Nissl pictures show nerve cells fairly intact, with occasional moderate losses in supratentorial layers.

CASE 10, a married woman, began to worry at 50 and died at 52, after residence in the hospital first for two months, and then for a year.

Of good family history, ambitious, a hard worker, she made an unfortunate marriage at 23. She had three children; she passed the menopause 49.

At 50, when her husband refused to work and planned to sell her home, she became sleepless, easily tired, unable to concentrate on her work, doubtful of her ability to do things. She took an overdose of laudanum. On entrance here the radial was sclerotic, the ankles edematous, while the urine showed albumen and casts. She had headache; was clear, oriented, inactive. After two months she made some improvement and was allowed to go home. Ten months later she was again admitted, inaccessible, irritable, with nothing suggesting hallucinations, and a frequent complaint of a queer feeling in her abdomen. At this time physically she showed an enlarged heart, a soft radial, blood pressure 105, a negative urine. During the last month of her life she was very weak and at times delirious.

ANATOMICAL DIAGNOSIS.

Very slight arteriosclerosis of internal mammaries, coronaries.

Thickening of aortic and mitral valves.

Chronic endocarditis.

Fibrous myocarditis.

Chronic parenchymatous nephritis.

Chronic passive congestion of liver.

Caseous nodule of right lung.

Apical scars of both lungs.

Chronic bronchitis.

Chronic obliterative bronchitis.

Lymphnoditis, superficial, mesenteric, retroperitoneal.

Injection of ileum.

Omental adhesions.

Fibroid of uterus and endometritis.

Sclerotic ovaries.

Slight chronic lepto- and pachymeningitis.

Slight asymmetry of brain.

Unequal pupils; cataract of right eye.

Poorly nourished.

Decubitus elbows; sacrum; acromion, right and left.

Muscles pale.

Bone marrow pale.

Scar of right thigh.

AUTOPSY.—*Cause of death doubtful.*

The brain weighed 1155 grams. Generally of about normal consistency, the right angular gyrus was the softest portion. The convolutions were well rounded. The right hemisphere was 1 cm. shorter than the left.

MICROSCOPIC EXAMINATION.

Little or no pigment except in the neuroglia cells of the calcarine cortex. No evidence of cell losses.

CASE II is a single woman whose first mental trouble came on at 44. She died at 48 after three years' residence in this hospital.

A second cousin is insane. The patient has been a cheerful woman of ordinary mental capacity and able to support herself. In the late thirties her menses became irregular, and in June of her 44th year they ceased altogether.

At the latter date came insomnia, self-accusation, hallucinations, visual and auditory; after ten months without improvement she was brought to this hospital. Physical examination on admission showed impaired resonance of lungs, an increase in knee-jerks and a slight ankle clonus of left foot, and tremor of hands and face. She was oriented, restless, apprehensive. She said, "I have abused myself," "I am paralyzed," "The clock is fixed to take care of my brains and that means I am not to get well,"

"Everything seems queer and far off and dull," "I know these things are not so but I can't help thinking of them." One instance is recorded of opisthotonus following a "pain in the head." In about three months came a change to a silly, violent mood, compulsive ideas. "I am not able to make people understand how good I have been." "Keeping in trouble all the time is the only way to make things straight." This mood continued, with good orientation and memory, to her death at 48, from swallowing a cloth.

ANATOMICAL DIAGNOSIS.

Hemorrhage, congestion and edema of lungs.

Acute congestion of spleen and kidney.

Chronic perisplenitis.

Cyst of left parovarium.

(Vascular system apparently normal.)

AUTOPSY.—*Cause of death was asphyxia.*

The brain weighed 1310 grams and beyond a general edema was not noticeable in the gross. The pia was clear. The basal arteries were free from gross changes.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation somewhat more variable than usual (much in right frontal region).

Neuroglia cell pigmentation variable (more in right frontal, left precentral, about the same amount in both calcarines).

Nerve cell pigmentation marked in frontals and calcarines, little in precentrals (but marked variation from cell to cell).

Nissl pictures suggest, but do not clearly show, moderate cell losses in supratentorial region (layers of medium-sized and larger external pyramids).

CASE 12, a widow, came to this hospital at 47 for two attacks of mental trouble, and then returned at 65 to remain for ten years.

Her mother died of asthma; an aunt was insane. The patient was a cheerful woman.

At 47, in the menopause, she complained of pain in the top of her head, was depressed and self-accusatory, improved; six months later grew worse, thought the family were going to be burnt, had auditory and visual hallucinations. She was very feeble. Improving again she was allowed to go home, where for eighteen years she "had spells of thinking herself on fire and wanting to jump out of the window." On returning to this hospital at 65 she was well nourished; her knee-jerks slightly increased. For the first few weeks oriented, quiet, silly, rambling in her talk, she became confused, noisy, hallucinated, doing things on impulse. A three months' period of complaints about having heart disease followed; then three months when she was quiet, well behaved, industrious. In the three following summers she had mild manic attacks, with intervals of clearness and quiet. Six

years after entrance she failed rapidly after much digestive disturbance. Memory defect for recent events appeared. In the seventh year came a manic attack; in the ninth she withstood an attack of lobar pneumonia, but two months after complained of dizziness. In the tenth year her pupils were small and did not react to light or accommodation; she showed good insight, memory, judgment to the time of her death from a sudden attack of edema.

ANATOMICAL DIAGNOSIS.

Edema ankles, eyelids, ascites.
Abscess of kidney.
Chronic nephritis.
Milk patch.
Vegetative endocarditis.
Basal sclerosis.
Chronic sclerosis.
Chronic peritonitis.
Chronic perisplenitis and perihepatitis.
Mesenteric lymphnoiditis.
Sago spleen.
Apical scar.
Bronchial lymphnoiditis.
Chronic fibrous pleuritis.
Chronic pachymeningitis.
Chronic leptomeningitis.
Dural tumor (small).
Bone marrow pale.

AUTOPSY.—*Cause of death was acute nephritis.*

The brain weighed 1310 grams. The dura was generally thickened and over the occipital region in the medium line presented a tumor 1 cm. in diameter. The pia was injected and slightly cloudy. The basal vessels showed areas of sclerosis. Convolutions, well rounded, showed shallow depressions in the supraparietal regions.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation moderate and even throughout.

Neuroglia cell pigmentation marked, and especially marked in precentrals.

Nerve cell pigmentation moderate, but perhaps somewhat more in left precentral than elsewhere. No certain evidence of cell losses in areas so far examined.

CASE 13 is that of a married woman who first became insane at 43 and who died at 68 after a hospital residence (very much interrupted) of about ten years.

Her uncle was insane; her sister and a son died of tuberculosis. She is described as cheerful.

At 43, after a long siege of nursing, she began to complain of headache, said she was Jupiter, under the control of her son's spirit, possessed of unbounded wealth. Noisy, incoherent, elated, fantastic, when she came to the hospital, she recovered in twenty-four days. Six months later she came to the hospital in another attack—this was like the first except that hallucinations of sight and hearing were noticed. She came in for six more attacks before she was 50; in the intervals she was progressively more demented and indecent. At 63 she was admitted for the last time, with a temperature of 101, an enlarged heart, a systolic murmur; her knee-jerks lively. She was clear and dressed in bright colors. "I am not a common insane patient." She stuttered and slurred in her loose, stereotyped talk. Six months before her death the urine showed red cells and albumen; at this time she began to vomit and from then on symptoms of gastro-intestinal origin were prominent. She was well oriented to within a few days of her death.

ANATOMICAL DIAGNOSIS.

Edema of left ankle.
Jaundiced skin.
Purulent bronchitis.
Acute cystitis.
Chronic periappendicitis.
Chronic peri-oophoritis.
Splanchnoptosis.
Chronic fibrous pleuritis.
Chronic fibrous epicarditis.
Sclerosis of coronaries, basal, aorta.
Chronic interstitial nephritis.
Atrophy of spleen.
Infarction of lung.
Purulent otitis media.
Purulent mastoiditis.
Unequal pupils.
Pigmentation of trunk.
Emaciation.
Calvarium dense.
Chronic fibrous pachymeningitis.
Chronic fibrous leptomeningitis.
Injection of pia mater.
Subpial edema.
General cerebral atrophy.

AUTOPSY.—Cause of death was carcinoma of stomach and pancreas.

Calvarium.—Frontal measures 0.6 cm., temporal 0.4 cm., occipital 0.9 cm. Is smooth, eburnated externally, internally wrought with deep grooves for the meningeal vessels. Orbital surfaces rough and prominent. The markings in the middle cranial fossa are prominent, amounting almost to exostoses. Diploe present.

Dura Mater.—Slightly thickened everywhere. Adherent in the post cranial fossa. Sinuses negative. Pacchionian bodies medium sized.

Pia Mater.—Bound to dura by a few adhesions at the frontal and temporal poles, is slightly thickened in the Sylvian region and over the inferior surface of the cerebellum and post cisterna. Pial vessels injected over the whole convexity. There is a marked subpial edema in all parts of the convexity (hydrops ex vacuo).

Brain.—Weight 1105 grams. The convolutions are atrophied in the frontal, central, parietal and occipital regions. The consistency in all parts is decreased, with more marked decrease in the parietal region than elsewhere. No granules in the ependyma of fourth ventricle or lateral ventricles.

Basal Vessels.—Show scattered areas of thickening in the different branches, but nowhere marked except in the carotids, which are diffusely thickened, but not calcified. The smaller cortical vessels are not thickened. Artery to the right corpus striatum shows a small atheromatous patch.

Pons and Cerebellum.—Weight 140 grams. Cerebellum everywhere softened. Pons decreased in consistency. Medulla normal.

MICROSCOPIC EXAMINATION.

The *pigmentation* of all cell types in the chosen regions is everywhere remarkably slight.

CASE 14 is that of a single woman whose insanity began at 45, who was brought to this hospital at 56 and died in ten days.

Always peculiar and seclusive, after the menopause at 45 came recurring episodes of delusions of persecution, followed by nearly normal intervals. In the attack for which she was brought here she claimed that everything had a bad odor, at one time fell to the floor, trembled, frothed at the mouth. Here exophthalmos, pulse 124; allowed needle to be stuck into eye and tongue without affect. She was mute, resistive, tube-fed.

ANATOMICAL DIAGNOSIS.

Edema and congestion of lungs.
Chronic diffuse nephritis.
Fatty myocarditis.
Valvular sclerosis.
Edema of lower legs.
Chronic localized peritonitis.
Chronic caseous lesions of spleen.
Pigmentation and fatty change of liver.
Scars of right apex.
Basal, coronary, valvular, sclerosis.
Encephalomalacia sixteen hours.
Chronic fibrous leptomeningitis, Rolandic.

AUTOPSY.—Cause of death was bronchopneumonia.

The brain weighed 1245 grams. The occipital poles and temporal regions were slightly softer than the remainder of the brain. The pia was moderately injected and was opaque over both Rolandic regions. The vessels at the base showed a few patches of sclerosis which were not present in the primary or distal branches.

Nissl pictures show the left superior frontal gyrus poorer than right in nerve cells, and the left precentral poorer than the right, with foci of subpial gliosis. In the superior temporal gyri the stellate cell layer of the left side is not so rich in cells as that of the right side. Hippocampal gyri: The left side section shows a focus of nerve cell poverty in the giant cell layer of the fascia dentata; the ependyma shows a general thickening without small breaks and in places is normal for long distances; there is a suggestion of focal cellular gliosis in the polymorphous cell layer. In general many axonal reactions are demonstrable in the frontal (large external pyramids) and precentral (Betz cells) regions. There is, however, some evidence of a greater long standing atrophy and gliosis of the anterior regions.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation everywhere moderate to marked.

Neuroglia cell pigmentation marked as a rule.

Nerve cell pigmentation chiefly in layers of medium size and large external pyramids. The precentral areas show occasional Betz cells highly pigmented, others not at all.

CASE 15 is that of a single woman of 48, whose mental trouble apparently began a few years before admission. She died after twenty-five days' residence.

At 44 she began to have fits, she slept in the day and was awake most of the night; her weight was 250. A dementing process followed. On admission here she was weak, drowsy, stupid, deaf, partly oriented, her memory poor for recent but fair for past events. In two weeks she showed more interest, complained of being lonesome. At any time a rational answer to a simple question could be obtained if the questioner could break through her drowsiness. She had considerable insight. Her voice was rough and expressionless. Physically the picture was that of myxedema: wide nose, thick, everted lips, large tongue, stubby extremities, edematous appearing skin with no pitting, loss of hair. There was a systolic murmur, weak thready pulse, many syncopal attacks. A few days before her death appeared symptoms of an acute infection of the urinary tract.

ANATOMICAL DIAGNOSIS.

Pulmonary edema.

Internal hemorrhagic pachymeningitis, right convexity.

Recent hemorrhages, subdural space.

Atheroma of aorta.

Fatty infiltration of heart muscle.
Chronic fibrous endocarditis.
Chronic fibrous pleuritis.
Hyperemia of spleen.
Fatty degeneration of liver.
Hyperplasia of thyroid.
Myxedematous hypertrophy of skin.
Panniculus dry, pale.
Hypertrophy of calvarium.
Cerebral atrophy, chiefly frontal.

AUTOPSY.—The cause of death was kidney abscess.

The calvarium weighed 450 grams. Between dura and pia was a thickened hemorrhagic membrane extending over the right hemisphere and depressing the cortex anterior to the Rolandic fissure. The cortex here had a necrotic appearance. At the base of the middle fossa was a small area of hemorrhage. The pia was notably thickened along the cranial nerves and vessels, very slightly thickened over the convexity; it was quite generally adherent to the cortex and could only be removed in small pieces; it was not especially cloudy; over the left hemisphere it was edematous. The basal blood vessels showed no notable changes. The convolutions in frontal and parietal regions were slightly atrophied; the surfaces of many of the frontal ones showed fine depressions and lines of contraction.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation slight to considerable.

Neuroglia cell pigmentation slight, except fusiform layer of left calcarine and lower layers of right calcarine areas.

Nerve cell pigmentation slight except precentrals, which vary, some cells negative, others supplied with an excess.

Nissl pictures.—Progressive changes in glia cells of all regions; increase of glia in superficial layer and in white substance; nerve cells in parietal region shrunken and in pyknomorphous condition; no active degenerative processes; leucocyte accumulation in many of the smaller arteries; hyaline degeneration of cerebral capillaries in all regions.

CASE 16 is that of a man whose first mental symptoms appeared at 47, who came to this hospital three years later and died after one month's residence.

His father was probably a suicide. He himself had been a steady worker, a moderate drinker; he had had inflammatory rheumatism, probably gonorrheal, at 24 and 27. From 35 to 47 he had many morning headaches; at the latter age he gave up drinking.

At 47 he became restless, sleepless, refused to see anyone, refused to eat, complained of a pressure in his head and a shaking in his bowels; later he developed hallucinations of sight. He thought that he was dead and the cause of all people's deaths. At 50 he improved considerably and went to

work for three months; then became over-talkative, claimed to have found a new tinning process, was boastful and elated. On entrance there was albuminuria. He showed flight of ideas, elation, hallucinations of hearing, perfect orientation. Three weeks after admission he was taken sick with dysentery and died five days later.

ANATOMICAL DIAGNOSIS.

Acute ulcerative colitis.
Lymphnoditis mesenteric, retroperitoneal, bronchial.
Thickened mesentery.
Fatty liver.
Chronic interstitial nephritis.
Bronchopneumonia.
Ventricular endocarditis.
Coronary and slight basal sclerosis.
Chronic fatty myocarditis.
Slight hypertrophy of heart.
Chronic perisplenitis.
Hypertrophy of prostate.
Emaciation.
Slight internal hemorrhagic pachymeningitis.
Slight leptomeningitis.
Encephalomalacia of temporal lobes (7.5 hours post mortem).
Perforation of left ear drum.

AUTOPSY.—*The cause of death was dysentery.*

The brain weight was 1450 grams. The dura was not adherent to the calvarium but to the pia over the vertex and along the longitudinal fissure. The pia, over the central and superior parietal gyri, was reddened; it was thickened over the sulcal vessels; it stripped readily from the cortex. The convolutions were well rounded except for the superior parietal gyri, which were small and depressed below the surface level. Brain substance firm, the temporal lobes a trifle softer than the rest. Ventricles are smooth; the choroid plexus slightly cystic. The frontal region on section retracts from the knife and the gray matter over the crowns of the gyri is china-white. The white matter shows many small bleeding spots.

MICROSCOPIC EXAMINATION.

Satellitosis is a fairly marked feature in a few areas of cell losses. *The perivascular cell pigmentation* is almost wanting. *Neuroglia and nerve cells* show it in slight degree.

CASE 17 is that of a man whose insanity came on at 45 and who died in this hospital after seven months residence.

His father died of apoplexy at 58, and father's brother had epilepsy. Otherwise family history is negative. Patient himself was a good worker,

earning \$1200.00 a year; of a nervous, conscientious sort. He admitted having clap, but denied syphilis.

A year before entrance he became tired and unable to sleep; gave up his work; said that he was sick and not good for anything. For a month before entrance ideas of self-reproach occupied his mind. "Am not even good enough to kill myself." On admission here his arteries were fairly palpable; heart seemed normal in size; soft systolic murmur; pulse of high tension; visible radial pulsation; urine showed a slight amount of albumin; epithelial and hyaline casts. His hands showed a slight tremor; his kneejerks were very much exaggerated. He was clear, agitated, sleepless, despairing. A week after admission his temperature was 101. He said, "I am unable to talk. Everything is blank to me. I have no memory; no friends; my bowels do not act." In a few weeks he manifested delusions of somatic character. A month before his death he said, "I haven't a home or a wife; how could I support a wife?" After falling to the floor he remained in a dazed, apathetic, stuporous condition for a few days; developed paralysis on the left; died.

ANATOMICAL DIAGNOSIS.

Cerebral hæmorrhage—right lateral ventricle.

Hæmorrhage beneath scalp.

Arteriosclerosis of internal mammary, iliac, basal, coronary arteries and aorta.

Chronic epicarditis.

Thickened aortic valve.

Endocarditis.

Hypertrophy of heart.

Acute pleuritis.

Bronchopneumonia.

Acute bronchitis.

Ulcer of neck.

Emaciation.

Calvarium eburnated.

Slight chronic pachymeningitis.

Cyst of pituitary.

Slight subpial edema.

AUTOPSY.—*The cause of death was cerebral hemorrhage.*

The brain weighed 1395 grams. There was a marked flattening of the convolutions over the parietal portion of the right hemisphere, and this area showed a lessened consistency.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation in general slight, except precentrals, where it is marked.

Neuroglia cell pigmentation everywhere considerable, but very well marked in precentrals and calcarines.

Nerve cell pigmentation in general slight, except precentrals.

CASE 18, a married man, had a first attack at 43 and died at 46, after a three years' interrupted residence at this hospital.

A sister of the patient had chorea when young; another sister is very nervous.

The patient himself was a very steady worker; at 42 he was working night and day. He complained of several attacks of blindness of short duration, of nausea, of sciatic rheumatism. At one time he left the house and said that he was going to cut his throat; he would grasp violently at his throat; he tried to strangle his wife and then asked forgiveness. A local physician found something wrong with the kidneys after the patient had complained about them. He tried to work, but couldn't. He saw knives and razors lying about the bed and had an uncontrollable desire to handle them. On entrance he showed a large heart, albumen in the urine, a fine tremor; he complained of a gagging sensation in his stomach immediately after eating, insomnia, weakness, buzzing in the head. He asked to be restrained so that he could not hurt anyone. After two months he felt better and went home. After three months he returned, fearing that he might harm someone, complaining of peculiar dull aches in his head with intervals of feelings of "head emptiness," giving a history of dizziness and (doubtful) auditory hallucinations. Here he showed ataxia, exaggerated knee-jerks, pupils reacting rather sluggishly to light and well to accommodation. Within a month he developed slurring articulation and auditory hallucinations; he misplaced words in test phrases, grimaced before the mirror; wanted "remedies for his brain." In September he made a good recovery from dysentery. In October, with many symptoms of tuberculosis of the lungs, he became more cheerful. In December after a bad attack of psoriasis he was still better mentally; his urine contained, as always, a few hyaline casts. In February came pains in his left leg, which became swollen to the thigh. At this time the notes say, "Patient constantly has hypochondriacal attacks, demanding medicine." On March 1 his temperature was 102, on March 4, 104. Throat culture for the K-L bacillus was positive. He was confused; had ataxia and tremor; died.

ANATOMICAL DIAGNOSIS.

Cerebral hæmorrhage.
Bloody discharge from nose.
Acute tracheitis and bronchitis.
Acute nephritis.
Acute splenitis.
Puriform thrombus of right transverse sinus.
Hæmorrhagic ganglionitis.
Softening of pituitary.
Cyst of the cerebellum.
Cortical destruction, occipital and temporal left.
Acute leptomeningitis.
Hæmorrhagic ileitis.

Tuberculosis right lung.
Scar at apex left lung.
Thrombus left popliteal vein.
Edema left foot.
Exudative pharyngitis and tonsillitis.
Hydropericardium.
Tricuspid and ventricular endocarditis.
Chronic fibrous myocarditis.
Hypertrophy of heart.
Hematoma of eighth rib.
Constriction of œsophagus.
Eversion of tip of ensiform.
Moderate splanchnoptosis.
Chronic perisplenitis and perihepatitis.
Chronic fibrous pleuritis.
Mesenteric lymphnoditis, pancreatic group.
Unequal pupils.
Hypertrophy of prostate.
Calvarium thin.
Chronic adhesive external pachymeningitis.
General cerebral gliosis.
Sclerosis of occipital veins, left.
Arteriosclerosis of posterior basal vessels; and left superior cerebellar arteries.

AUTOPSY.—The cause of death was cerebral hemorrhage.

The brain weighed 1475 grams. The dura was slightly thickened and very adherent to the skull. The meningeal branches of the occipital veins are visibly hyperdistended and on the left side notably thickened. The basal vessels are thin and delicate. The hemispheres are equal and the consistency increased. Over the inferior surface of the left occipital and posterior temporal lobes occurs a diffuse hemorrhage which destroys the cortex and extends into the gray matter for 2 or 3 cm. On the right side in the same area injection surrounds the distribution of the posterior cerebral artery. There is a cerebellar area of softening 2 cm. in diameter. The left superior cerebellar artery is thickened and of unusual size. The Gasserian ganglions are hemorrhagic. The pituitary was soft with a minute area of softening in the center.

Microscopic examination of the small amount of material available shows *nerve cell pigmentation* exceeding that of *neuroglia cells*, while the *perivascular cell pigmentation* is negligible.

CASE 19 is a man whose insanity began at 49 and whose death occurred five months later after less than three months' hospital residence.

The father was eccentric, and there were instances of insanity on the paternal side.

After considerable loss of money mental symptoms appeared in the following order: Worry, insomnia, restlessness, depression, delusions, possibly

visual hallucinations, agitation, ideas of negation and stuporous condition preceding death. Orientation was fairly well preserved till the last few days. Physical examination showed cardiac hypertrophy and arteriosclerosis. (A full report of this case in J. of N. and M. D., 1908, 300.)

ANATOMICAL DIAGNOSIS.

Hypostatic pneumonia.

Hydropericardium.

Cardiac hypertrophy.

Atheroma of aorta; slight in basal vessels.

Mitral sclerosis.

Chronic localized fibrous peritonitis.

Slight fatty degeneration of liver.

Edema of pia mater.

Chronic sulcal and sylvian leptomeningitis.

AUTOPSY.—*The cause of death was pneumonia.*

The brain weighed 1445 grams. The pia contained considerable fluid and was milky over the vessels. The large blood vessels at the base showed some yellow atheromatous patches of irregular distribution; the lumina of the arteries was not diminished. The choroid plexuses showed a few minute cysts. There were no focal areas of softening in the brain.

MICROSCOPIC EXAMINATION.

From the fuller account of Southard and Mitchell, the following may be taken for the purpose of the present correlation:

Perivascular cell pigmentation everywhere marked.

Neuroglia cell pigmentation tends to affect the intermediate layers of the cortex.

Nerve cell pigmentation of the larger elements (Betz, solitary cells of Meynert) apt to be present, but present in the smaller elements, notably in the larger external pyramids of the frontal regions.

Nissl preparations showed an essentially normal layering.

CASE 20 is that of a single man, a shoe-worker, who began to worry at 41, came to the hospital at 45 and died fifteen months later.

A bright, steady man, he took no medicine and was never sick until he failed in business.

At this time he began to worry and felt so badly that he went to the almshouse. For the next four years he did not improve, and before his admission to the hospital he expressed ideas of persecution and reference. Here he writhed and groaned throughout the physical examination; his extremities were blue, his movements feeble and groping; his knee-jerks greatly increased. In a few days he began to sit in one place, crooning, showing many stereotyped mannerisms, paying no attention to his surroundings. During his stay in the hospital he uttered words only once and then, a month before his death, asked an unimportant question.

ANATOMICAL DIAGNOSIS.

Pulmonary tuberculosis.

Bronchopneumonia.

Congested diploe.

Slight adhesive pleuritis.

Emaciation.

Decubitus.

(Liver weight 880 grams.)

(Arterial system seems normal.)

AUTOPSY.—*Cause of death was pulmonary tuberculosis.*

The calvarium weighed 410 grams, the brain 1400, each hemisphere 555 grams, and the brain stem 280. The pia was clear and delicate, the basal vessels free of gross changes. The cerebral substance was of soft consistency (8½ hours post mortem).

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation marked everywhere, but less marked than *neuroglia cell pigmentation*. Nerve cell pigmentation more varied than either; especially the *left precentral* gyrus shows some larger elements loaded with large granules, others practically without pigment.

CASE 21 is a man who had his first manic attack at 44 or 47, going to a Connecticut hospital for six months, then coming here. He was violent; "could perform miracles." In five months he recovered and went home. At 62 he was again admitted, after four months of irritability, talkativeness, headache and at times confusion. For the next eight years he was euphoric—a chronic manic case.

AUTOPSY.—*The cause of death was dysentery.*

The brain weighed 1360 grams. The pia was thin; the convolutions full, showing no atrophies. The ventricles were smooth. The larger cerebral vessels showed no changes.

ANATOMICAL DIAGNOSIS.

Ileocolitis.

Ulcers of ileum and colon.

Slight sclerosis of coronary arteries.

Chronic apical pleuritis.

Chronic perihepatitis.

Cholelithiasis.

Chronic cholecystitis.

Hæmatoma of right ear.

Chronic pachymeningitis.

Chronic fibrous endocarditis.

Gaping sulci (precentral).

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation everywhere marked and almost uniform.

Neuroglia cell pigmentation marked or excessive.

Nerve cell pigmentation considerable to excessive (excessive in Betz cells, precentral).

Nissl pictures show subpial gliosis general and a suggestion of supratentorial pyramidal cell losses (frontal).

CASE 22 is a divorced man in whom mental symptoms first appeared at 41, who entered Worcester hospital at that time and this hospital at 46, dying nine months later. (The age at death may have been 51, which would carry the onset forward to 45.)

His father was alcoholic and died insane; his mother was nervous; a sister is insane. The patient was a bright boy, never strong; he married at 27, had two children, was divorced because of his alcoholic habits. At 38 he was very irritable.

At 41 he talked to himself; lost his way in a familiar city. At the hospital he admitted auditory hallucinations, a strange feeling in the back of his head; later became voluble, over-active, said that people were following and talking about him. After ten months he seemed normal and was discharged. He supported himself as a cook. At 46 he began "to ramble about religion; he said that every time he mentioned the name of God he was stricken blind and could not open his eyes until inspired by a good thought. Here he never was known to answer a question directly. He would stop his walking and close his eyes queerly, or blink them, when asked for explanation." "You shouldn't ask a crazy man, he isn't supposed to know." "I lost my eyesight completely." Other replies—"They say I live in Lynn." "They say my father's name was Thomas Jefferson, but I can't help that." "Insane never keep track of the days, a thousand years in my sight is but a day." Always giving the impression of a strange exhilaration, probably well oriented, punning, rhyming, working well, often pacing the hall with peculiar swings and steps, he was five feet six inches in height, abominous, weight 300. Four months after admission came an attack of jaundice which cleared in another month. In thirty-four days it reappeared, with tenderness over the gall-bladder, vomiting, collapse, dyspnoea, death.

AUTOPSY.—*The cause of death was acute cholecystitis.*

The brain weighed 1320 grams. It was firm; the convolutions well rounded.

ANATOMICAL DIAGNOSIS.

Abscesses of liver.

Acute cholecystitis.

Cholelithiasis.

Perforation of gall-bladder.

Acute peritonitis.

Jaundice.
Fatty infiltration and degeneration of pancreas.
Fatty liver (4940 grams).
Cirrhosis of spleen (640 grams).
Cirrhosis of kidney and pancreas.
Chronic nephritis.
Chronic aortic and pulmonary endocarditis.
Anthraxis of bronchial lymphnodes.
Lipoma of back.
Obese.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation in general slight (considerable right superior frontal).

Neuroglia cell pigmentation considerable except precentrals and left frontal.

Nerve cell pigmentation marked in larger external pyramids of precentrals, elsewhere less (slight, calcarines).

CASE 23 is a married man * who first became insane at 45, came to this hospital at 57 and died five months later.

A laborer of an ordinary sort. An uncle and a distant cousin were insane.

At 45 he began to think that fellow employees were mesmerizing him; he refused his pay because it had poison on it; voices told him to kill someone. At 56 he was still suspicious and very restless; there were two occasions when he had "sinking spells" for two or three weeks. On entrance he showed a dry skin, acne, pulse of poor volume, albuminuria, tremor, weakness, pupils slightly irregular and reacting poorly to light and accommodation; varicocele. Peripheral sclerosis was not marked; there was no speech defect. He was disoriented, irritable, slightly euphoric. He showed poor memory and some fabrication. In twelve days he became stuporous, paid no attention to pin pricks, had a temperature of 102; showed a tendency to cerea. Ten days later, still in bed, he said that God gave him the power to speak; "something comes over me and I can't talk—it's mesmerism." He complained of pain in head and arm, hallucinations. In another month he became weak and mute. He showed the signs of a pneumothorax.

AUTOPSY.—*The cause of death was bronchopneumonia.*

The pia, slightly opaque along the vessels, is considerably distended with clear fluid. The surface of the brain shows slight narrowing associated with very slight puckering of the frontal convolutions.

Localized bronchopneumonia with abscess formation.

Atelectasis of right lung.

Emaciation.

Slight generally distributed arteriosclerosis.

Chronic fibrous pleuritis.

Old scar of left lung.
Tricuspid insufficiency (relative).
Chronic diffuse nephritis.
Slight pachymeningitis.

MICROSCOPIC EXAMINATION.

From L. B. Alford's description and a re-examination from the point of view of the present correlation, the following may be stated:

Perivascular cell pigmentation moderate.

Neuroglia cell pigmentation everywhere uniform and moderate.

Nerve cell pigmentation moderate and somewhat variable (*e.g.*, some large external pyramids of precentral regions show no pigment, others much).

Nissl pictures show occasional nerve cells markedly affected by satellitosis, but most nerve cells are intact. Frontal gliosis (white matter).

CASE 24 is that of a man who began to act queerly at 46, who came to the hospital at 58 and died a year later.

A brother disappeared. A steady worker, quiet and good-natured, a weaver.

Somewhere in the forties he began to think that he could get gold out of stones; that moving picture companies had something to do with his stomach, making films from his feces to use against him. He could read secret symbols. On admission a tremendous hernia extended into the left scrotum; the same ideas occupied his mind; he had auditory hallucinations; he was well oriented and his emotional tone was normal.

AUTOPSY.—*The cause of death was intestinal obstruction.*

The brain weighed 1415 grams. The temporal lobes are softer than the rest of the brain. On the left side is a slight atrophy of the frontal region and flattening of the gyri in the motor region; these conditions are not so marked on the right. On section a cyst 4 mm. in diameter was found in the white matter of the left parietal region.

ANATOMICAL DIAGNOSIS.

Left inguinal hernia.
Bloody ascites.
Mesenteric lymphnoditis.
Congestion of lungs.
Chronic diffuse nephritis.
Valvular endocarditis.
Hypertrophy of heart.
Chronic fibrous myocarditis.
Interstitial fibrous splenitis.
Chronic perisplenitis.
Atheroma, general.
Chronic pachymeningitis.

MICROSCOPIC EXAMINATION.

Perivascular cell pigmentation moderate to slight.

Neuroglia cell pigmentation moderate, uniform.

Nerve cell pigmentation everywhere slight.

CASE 25 is a man who became insane at 46, entering the hospital a month after the onset and dying three months after.

There was a negative family history. The patient had been a student at Harvard and successful at business and politics. At 24 he had a syphilitic iritis. He married at 41; had no children. At 44 he suffered from pain in his head and jaw and all his teeth were extracted.

A month before his admission at 46 he was unconscious for twenty-four hours and then very dull with intervals of brightness. He said that he "was dead and could not eat"; if he drank milk "someone else got it." On admission the pupils were irregular, unequal, with a slight reaction to light. There was tremor; reflexes were not disturbed. He was probably oriented. "I ain't a live man." "My leg is nothing but bone." "You can hit my leg with a hammer and not hurt me." "I have no pulse—no name." He was indifferent, irritable; finally had to be tube-fed. Wassermann in the blood serum strongly positive.

The cause of death was *bronchopneumonia*, possibly related to an acute *ulcerative gastritis*. There was an *acute renal degeneration* on the basis of a *chronic interstitial nephritis*. *Aortic*, slight *coronary* and slight *basal cerebral arteriosclerosis*.

Among chronic lesions were *endocarditis*, *splenitis*, *peresplenitis*, *perihepatitis*, *pleuritis*. Slight *hydrothorax* and *pericardium splachnoptosis*. *Trochanteric decubitus*. *Emaciation*.

The brain weighed 1410 grams (Tigges' formula yields 1448 grams for subject 181 cm. long). The dura was adherent on the left side (frontal) and on right side (temporal and occipital—see remarks on inequality of hemispheres *infra*). Sulcal leptomeningitis along vessels (vertex, frontal, along longitudinal fissure).

Brain consistence increased, "doughy," especially prefrontal and precentral.

Cervical spinal dura thickened (cf. Wassermann serum positive). Spinal gliosis (no evidence of degeneration by Weigert method unless faintly in the cervical Goll).

The most striking feature of the brain is the *inequality of the hemispheres*, the left being longer than the right by about 1 cm. in greatest antero-posterior diameter. The *shortening* of the right hemisphere appears to be chiefly at the expense of the polar tissues and more particularly of the *frontal* polar tissue. The *occipital* polar regions differ in that the left pole is more tapering, whereas the *right pole* seems *compressed* forwards and downwards to yield an impression of greater bluntness and a tendency to the formation of a flattened posterior surface instead of a conical pole. There is, along with this shortening, little or *no evidence of distortion*, and

bilateral symmetry prevails everywhere except in the polar convolutions. The convolutions of the under surface of the right frontal region fail to show definite signs of compression or redistribution of tissue; but on the other hand, the lower contour of the right temporal region suggests by a well-defined bulge (toward the posterior end of the third temporal convolution) that the tissues of this region have been antero-posteriorly compressed between the anterior face of the middle cerebral fossa and that hollow of the occipital bone which receives the occipital lobes. Unfortunately no exact data as to either the capacity or—what would be more important—a bilateral volume-comparison between the two middle fossæ are available.

A study of interior conditions yields some pertinent data. Thus the ventricles, wherever they appear in coronal sections, have not the same shape on the two sides, and posteriorly the *right ventricle* is appreciably *smaller than the left*. This condition strengthens still further the idea of right-sided compression which the brain may have undergone at some remote and probably very early date.

Moreover a study of the color-contrasts, grey and white, as revealed by photograph seems to indicate that the grey-producing elements must be less in evidence in the right superior, middle, and inferior frontal convolutions than in their left-sided fellows. This whitening-out of right frontal grey matter is best marked far forward (prefrontal region) and not at all marked in the orbital convolutions. A similar less well marked differentiation between right and left affects a coronal section taken through the occipital tissues: here especially appears to suffer a convolution inferior to the calcarine fissure.

The anterior ascending Sylvian branches are marked on both sides, and these so-called *intermediate precentral areas* give a certain impression of poor development (or, what seems less likely, atrophy) on both sides.

The corpus callosum has a good area of cross-section, but there is nevertheless a moderate thinning anterior to the splenium.

MICROSCOPIC EXAMINATION.

Little or no pigment in any of the cell types.

V. CLINICAL SUMMARY.

SEX.

There are 15 female and 10 male cases in this series. The greater proportion of depressed cases, the association with the menopause, the occurrence of symptoms referable to the thyroid, tend to make of the women a more united group.

HEREDITY.

The family histories of three cases are unknown (8, 14, 15). Those of six cases (1, 5, 10, 20, 24, 25) are good.

In two cases (6, 11) a cousin is insane; in three (17, 12, 13) an uncle or aunt; in one (23) both an uncle and a cousin.

In five cases (7, 9, 16, 19, 21) a father or mother is insane; in three cases (2, 4, 18) a brother or sister; in one case (22) both a father and a sister; in another (3) both a mother and a brother.

In three cases, then, we know nothing of the hereditary factors; in six cases they are good; in 16 insanity appears in other members of the family and in 10 of these it appears in the parents or brothers or sisters.

Hereditary factors appear in 74 per cent of the cases with adequate history.

ANTECEDENT FACTORS.

The menopause was present at the onset of the first mental attack in seven of the fifteen women, and probably in one other case. In two or three more instances onset came within a year after the menopause. In two cases (9 a depression and 13 an excitement) onset preceded the menopause. Uterine cancer preceded the mental symptoms in one of the remaining cases and in the other we have no data.

In two cases extreme adiposity was associated with the onset of mental disease—in a woman with myxedema (15) and in a man (22) with pancreatic lesion.

As might be expected in the personalities of a group which has reached the forties without breakdown, only one is described as seclusive and peculiar (14, probably dementia præcox) while of those described 14 out of 16 are regarded as "normal, cheerful, sociable."

In trying to find how much arteriosclerosis was present near the onset of the psychoses we have used the history, the physical examination and the autopsy report—the last item losing its value as the age at death draws away from the age at onset.

Our group, from which the post-apoplectic cases had been ruled out, showed few evidences of early arteriosclerosis. Case 10 gave some clinical signs of arterial disease at 50 which autopsy at 52 failed to substantiate; so with cases 11 and 20. Three men (16, 17, 18) showed arteriosclerosis clinically and anatomically which probably dated back to the onset. Another man (19), generally sclerotic, showed neither the mental nor microscopical pictures

which usually are associated. Case 25 began with a curious stupor (catatonic or apoplectic) and at autopsy arterial change was very slight.

Enlarged or abnormally functioning heart was noticed in six cases near the onset (7, 8, 10, 15, 18, 19). In two (4, 9) indigestion was regarded as an upsetting factor. Onset followed a cancer in case 5, hernia in case 24, a severe burn in case 3. One woman (4) had been deformed from infancy.

Cases 6 and 10 apparently broke down under unusually heavy domestic burdens.

Alcohol was prominent in the histories of two men (16, 22).

GENERAL CLINICAL FEATURES.

As the shortest way to bring the summary of disease courses to mind we present the following table of ages at onset, subsequent attacks, and death.

TABLE II.—AGE AT ONSET, SUBSEQUENT ATTACKS, AND DEATH.

Case.	Sex.	Age at			Duration of	
		Onset.	Subsequent attacks.	Death.	Attacks.	Life after onset of first attack.
1	F	48	52-56-65	65	5 years	17 years
2	F	42	Continuous	50	8 years	8 years
3	F	50	73	73	10 months	24 years
4	F	47	50	67	17 years	20 years
5	F	42	Continuous	42	7 weeks	7 weeks
6	F	44	Continuous	46	18 months	18 months
7	F	46	46-58	59	10 years	13 years
8	F	49	Continuous	62	11 years	11 years
9	F	46	Continuous	46	6 months	6 months
10	F	50	50-51	52	14 months	2 years
11	F	44	Continuous	48	4 years	4 years
12	F	47	One a year?	75	many years	28 years
13	F	43	Many, 8	68	many years	25 years
14	F	45	3 times a yr. for 11 yrs.	56	5 years?	11 years
15	F	44	Continuous	48	3 years	3 years
16	M	47	47-50	50	2 yrs. 9 mo.	3 years
17	M	45	Continuous	46	19 months	19 months
18	M	43	Remissions	46	3 years	3 years
19	M	49	Continuous	49	5 months	5 months
20	M	41	Continuous	47	5 years	5 years
21	M	44	44-47-62	70	9 years	26 years
22	M	41	41-46	47	2 years?	6 years
23	M	45	Continuous	57	12 years	12 years
24	M	46	Continuous	59	13 years	13 years
25	M	46?	Continuous	46	4 months?	4 months?

Attacks with recovery characterize six persons (1, 3, 12, 13, 21, 22).

Remissions characterize six cases (4, 7, 10, 14, 16, 18).

Continuous progress was observed in thirteen instances (2, 5, 6, 8, 9, 11, 15, 17, 19, 20, 23, 24, 25).

The longest continuous courses, 12 and 13 years, were in paranoid men. The durations of the others in order were: 11 years, 8, 5, 4, 3, 1.5, 1.5 years, 6, 4, 4 months, 7 weeks.

The most striking difference in durations of disease and life appeared in case 3, who in 24 years was ill 10 months.

Delusions characterized all the patients except one (15). The most prominent group is the somatopsychic, which appears in fourteen of the records (3, 4, 5, 6, 7, 9, 10, 11, 17, 18, 19, 22, 24, 25). Delusions of persecution are found in six cases, those in women having a sexual tinge (6, 7, 14, 20, 23, 24); allopsychic delusions appear also in seven other instances (2, 3, 9, 11, 19, 24, 25). Self-accusatory ideas appear in ten (1, 2, 3, 4, 6, 9, 11, 12, 16, 17); grandiose ideas in four (2, 4, 13, 21); ideas of self-unreality in two (19, 25); a total of 14 patients in whom autopsychic delusions are obvious. Delusions of negation appear in five (2, 3, 17, 19, 25) and of unreality in four cases (6, 11, 19, 25).

With reference to the somatic delusions, especially those of hypochondriacal sort, it is interesting to note that the actual physical conditions were rather worse (with allowance for obvious absurdities) than the patients' complaints would lead one to believe. Apparently the patient is apt to be nearer the truth than the observer who sees many superficial inconsistencies in his tale of woe.

Signs of *dysthyroidism* appeared in 4 cases. Cases 1, 2 and 14 showed exophthalmus with high pulse rate. Case 2 showed tremor also. Case 15 showed myxedema, obesity. Case 22 showed obesity with pancreatic lesion.

Apprehensiveness is a marked feature of ten cases (1, 2, 3, 6, 8, 9, 12, 18, 19, 20).

Hallucinations are shown definitely in 14 cases, and probably in 3 more, out of the 25 under consideration. The auditory type in thirteen (1, 2, 7, 8, 9, 11, 12, 13, 16, 18, 22, 23, 24); the visual in six (8, 11, 12, 13, 16, 18), always combined with auditory; the olfactory type in one (14).

Memory defect was brought out in only two instances (1, 23, 7?) and then late in the disease, at the ages of 56 and 65.

Orientation was good in almost every case; in two only was it partially disturbed in the early course of the disease (14, 15).

DIAGNOSIS.

We hesitate to fit a diagnosis, according to the classifications now in vogue, to these disease forms, and we recall the sentence of Kraepelin to the effect that the field of the presenile psychoses is to-day the darkest in all psychiatry.

Our attempt gives us the following result:

TABLE III.

- | | |
|----------|---|
| Case 1. | A manic-depressive condition complicated finally by arteriosclerosis. |
| Case 2. | A manic-depressive depression with involutinal coloring. |
| Case 3. | Two attacks of manic-depressive depression. |
| Case 4. | Manic-depressive depression. |
| Case 5. | Symptomatic depression. |
| Case 6. | Manic-depressive depression with involutinal coloring. |
| Case 7. | Arteriosclerotic dementia. |
| Case 8. | (Apprehensive excitement with dementia.) |
| Case 9. | Manic-depressive depression of the involutinal type. |
| Case 10. | Manic depressive depression. |
| Case 11. | Presenile psychosis. |
| Case 12. | Manic-depressive; both phases. |
| Case 13. | Manic-depressive manic with dementia. |
| Case 14. | Dementia præcox? |
| Case 15. | Myxedematous insanity. |
| Case 16. | Manic-depressive; both phases. |
| Case 17. | Manic-depressive depression with arteriosclerosis. |
| Case 18. | Arteriosclerotic dementia, depressed state. |
| Case 19. | Manic-depressive depressed (Cotard). |
| Case 20. | Presenile psychosis with catatonic features. |
| Case 21. | Manic-depressive manic. |
| Case 22. | Manic-depressive mixed. |
| Case 23. | Presenile psychosis with catatonic features. |
| Case 24. | Dementia præcox. |
| Case 25. | Manic-depressive depressed. |

The diagnosis of a manic-depressive condition, then, is indicated in 15 of these cases, while three seem to fall under the heading of presenile psychosis, and only two under arteriosclerotic dementia.

If in a series of 124 cases arising in the forties, with the returns from gross and microscopical post-mortem examinations to help, we can find only 11 cases (2+9 in the post-apoplectic group) which deserve to be called arteriosclerotic dementia, this diagnosis is one to be very guardedly made by the clinician.

VI. ANATOMICAL SUMMARY.

Placing our cases in order of age at death we naturally find a general increase of arteriosclerosis with age. Comparing the ruled-out group of post-apoplectic cases, we may claim that our group has been lightly touched by arterial disease. Of the 13 cases over 50 the basal cerebral vessels were free of gross change in 7 instances.

The following table of brain weights shows 7 female cases underweight, one over; 3 male cases overweight, none under.

TABLE IV.—BRAIN WEIGHTS.

Case.	Age at death.	Brain weight.	Tigges' formula.	Case.	Age at death.	Brain weight.	Tigges' formula.
4	67	1040	1184 —	12	75	1310	1264 +
8	62	1085	1160 —	22	47	1320	1312
6	46	1105	1304 —	21	70	1360	1344
13	68	1105	1280 —	17	46	1395	1344 +
10	52	1155	1240 —	25	46	1410	1448
3	73	1195	1304 —	20	46	1410	....
1	66	1200	1216	24	59	1415	1384
5	42	1240	1248	19	49	1445	....
14	56	1245	1216	16	50	1450	1368 +
9	46	1260	1216 —	18	46	1475	1248 +
11	48	1310	....	....	....	....	....

Tigges' formula (height in centimeters x 8) is used as a ready means of obtaining the expected weight of the normal brain.

The distribution of pigment through the brain cells can be shown roughly in tables, if we represent no pigment by o, slight by +, moderate by ++, marked by +++, and an extreme amount by +++. It is often necessary to indicate two degrees of pigmentation in the same area, and to mark *var* those areas where there was marked variability in the pigmentation of the cells throughout one field.

TABLE V.—PIGMENT DISTRIBUTION.

Case	Duration of life after onset.	Perivascular cells.	Glia cells.	Nerve cells.
5	7 weeks	o	o (+ occip)	o
25	4 months	o	o	o
19	5 months	+++	+++	+++
9	6 months	+	+++ (except g. rect.)	o
6	18 months	+	++ to +	+
17	19 months	+ (++) present	++ or +++	+ (++) present
10	2 years	o	o (+ occip)	o
18	3 years	o	++	+++
16	3 years	o	+	+
15	3 years	+++ (o present)	+++	+++
11	4 years	+ var	+ to +++	o to +++
20	5 years	+++	++++	+++ var
22	6 years	++	++	++ var
2	8 years	++ to +	++ to +	+ to ++
14	11 years	++	++	++
8	11 years	+++	+++	+++
23	12 years	++	++	++ var
7	13 years	+++	+++	+++
24	13 years	+++ to +	++	+
1	17 years	+++	+++	+++
4	20 years	o	++	+++
13	23 years	+	+	+
3	24 years	+	+ (+++ occip)	+
21	26 years	+++	+++	+++
12	28 years	+++	+++	+++

If we contrast Cases 21, 3 and 12, dying at 70, 73, and 75 years respectively with Cases 5 (dying at 42) and five others, 20, 9, 6, 18, 17 (all dead at 46), we find that all three septuagenarians show pigment in the three loci, whereas those who died at 42 (one case) and at 46 (6 cases) show as a rule (5 cases) little or no pigment in the perivascular and nerve cell loci but somewhat marked variations in amount in the neuroglia cell locus (2 cases negligible amounts). It must be remarked that one of the septuagenarians showed very slight amounts of pigment in any locus (except calcarine neuroglia), and this case (3) was precisely a case in which, although 24 years had elapsed since the first attack, the patient had been mentally normal in the interval. In contrast with this, we may mention 20, with maximal pigment in most loci (especially neuroglia; nerve cell locus variable in amount); this case had cyanosis of extremities and phthisis.

TABLE VI.

Case No.	Age at death.	Perivascular cells.	Glia cells.	Nerve cells.
5	42	0	0 (+ occip)	0
6	46	+	++ - +	+
9	46	+	+++ (except g. rect.)	0
17	46	++ (++) precent)	++ or +++	++ (++) precent)
18	46	0	++	+++
25	46	0	0	0
20	47	+++	++++	+++ var
22	47	++	++	++ var
11	48	+ var	+ - +++	0 - +++
15	48	+++ (0 precent)	+++	+++
19	49	+++	+++	+++
2	50	++ - +	++ - +	+ - ++
16	50	++ (++++ precent)	+	0
10	52	0	0 (+ occip)	0
14	56	++	++	++
23	57	++	++	++ var
7	59	+++	+++	+++
24	59	++ - +	++	+
8	62	+++	+++	+++
1	65	+++	+++	+++
4	67	0	++	+++
13	68	+	+	+
21	70	+++	+++	+++
3	73	+	++ (+++ occip)	+
12	75	+++	+++	+++

THE RELATION OF ARTERIOSCLEROSIS TO FIFTH DECADE INSANITIES.

We may repeat for the fifth decade what was asserted for the sixth and seventh decades, "There seems to be no good ground for asserting that arteriosclerosis runs parallel with these insanities or has much more than a complicating relation to them." We except Cases 7 (?), 8 (?), 11 (?), 18.

Our case 3 is a good commentary on this assertion; psychosis at 50, health for 24 years, psychosis at 73, with a clinically and anatomically well-marked sclerosis which, we infer, developed without any corresponding mental change.

CORRELATIONS WITH SENILE ATROPHY.

The weight of the heaviest female brain is less than that of the lightest male. Seven of the female brains are underweight

by Tigges' formula: none of the male brains is underweight. Duration of disease does not run parallel to the weight variations. On the average, however, the duration of life after onset was 11 years in the women, 7 in the men; this offers a rough correlation, not very satisfactory in view of the fact that the oldest man and the oldest woman had overweight brains.

RELATIONS TO DISORDERS OF INTERNAL SECRETION.

The menopause was found closely associated with onset in most of the women; while this is to be expected, it is not less important because obvious. That lack of thyroid secretion should apparently cause the psychosis in one case, and increased secretion appear in three cases a year or more after onset, is surprising in a group of 15 women chosen as these were.

RELATION OF FIFTH DECADE INSANITIES TO DEMENTIA PRÆCOX, TO MANIC DEPRESSIVE PSYCHOSES AND INVOLUNTARIAL MELANCHOLIA.

One may well hesitate to make a diagnosis of dementia præcox in any of this group. There seems to be little doubt in the case of a man with foolish paranoid ideas and lack of affect (24). The catatonic symptoms in three other cases (23, 20, 14) we may regard, as Kraepelin now suggests, as having only a superficial resemblance to the symptoms of the earlier decades.

The traits of the manic depressive psychoses, however, are seen everywhere in this group, and form a most tantalizing problem. We can say, without taking much for granted, that case 3, with its widely separated depressions, and case 21, with its distinct manic attacks, are pure cases (old recurrent melancholia and mania). We can imagine little objection to saying that five other cases are essentially manic-depressive but complicated by mental symptoms associated with arteriosclerotic (1, 13, 12, 17) and senile (4) changes. It is hardly worth while to consider manic-depressive insanity as applicable to the myxedema case (15), the paranoid woman (14), or the case classed above as dementia præcox. This leaves us with 15 cases, all of them liberally sprinkled with manic-depressive traits, all of them incomplete forms, almost all presenting facts hard to reconcile

with any diagnosis. A strange group, selected because of its lack of certain characteristics, yet in some degree possessing common features—depressed, but with more cause than usual for the depression, clear, not sclerotic, not atrophic, showing striking but not uniform evidence of disturbance of internal secretions, and great variability in the outcome.

Starting this study with only a method, and no theory to prove or attack, it seems to us that the result has been to drive into the open a curious set of cases (an involution group) and make evident a further line of attack, a similar study of the decade just below them.

SUMMARY AND CONCLUSIONS.

1. We have reviewed a group of 25 cases of mental disease (Danvers State Hospital material), so selected as to offer a fair sample of mental diseases arising in the fifth decade of life.

2. Our principle of selection excluded all cases which were obviously *not* characteristic of the fifth decade (paresis, alcoholic mental disease, and the like); the group of non-characteristic cases thus excluded was extremely large (approaching 80 per cent of all cases arising in the decade) and the preventable diseases alone amounted to over 60 per cent.

3. We remained with a group of 25 cases (10 males and 15 females) which present certain common aspects. These cases may be *negatively* defined as *not* due to syphilis, alcohol, cerebral arteriosclerosis, brain atrophy, or other factors yielding coarse brain disorder; as not possessing pronounced schizophrenic features; as not uniform in course or outcome; as not likely to show either elation or expansive delusions. They may be positively defined as almost, if not quite, constantly subject to delusions at some stage in each case; as yielding manic-depressive traits in the large majority of cases; as prone to depressive features; as possessing a strong hereditary taint (74 per cent of properly studied cases); as not infrequently suggesting disorder of glands of internal secretion.

4. The delusional features, present in all cases (save one of myxedema), were not characteristically of any particular form; the delusions were somatic in 14 cases; dealt with various alterations of personality in 14 cases (combined with somatic delusions

in 8 instances); and (superficially at least) dealt with the social environment in 13 cases (6 times combined with other forms).

5. As to somatic delusions, it is further of note that a physical basis could be recognized for many of them in diseases of the viscera; and that, on the whole, these visceral counterparts of the delusions were more serious than the patients' complaints themselves.

6. Delusions of negation (5 instances) and of unreality (4 cases) do not bulk so large statistically as they are apt to in descriptions of so-called involution-melancholia.

7. The group, taken as a whole, is far more suggestive of manic-depressive insanity than of dementia præcox or of any other form of mental disease.

8. On the whole, depression is the most common manic-depressive feature of these cases: but the constant occurrence of various delusions alongside the depressive emotions makes the latter seem far from "causeless," certainly not so causeless-looking as the depressions of manic-depressive insanity.

9. It cannot be dogmatically asserted; but, on the whole, these patients seem more dominated by various ideas and by various more or less false beliefs than are the manic-depressives of earlier decades, and are perhaps more victims of intellectual than of emotional or volitional disorder. However, this may be more appearance than reality, and further work may again pull the emotions, and particularly the depressive emotions, into the genetic foreground.

10. As to the designation "involution-melancholia" for these cases, it may be surmised that the term was adopted by alienists having *unpleasant delusions* at least as much in mind as *unpleasant MERE emotions*. Perhaps it is unwise to seek to overthrow the classical term before more intensive work has been done on the actual relation of the intellect to the emotions in this group: how far then, it may be asked, is the melancholia of involution merely systematic and responsive to intellectual conditions?

11. Since Freud has claimed a sexual basis for paranoia and even perhaps for paranoic states falling short of paranoia, it is fair to inquire how far the present group has a sexual basis: three of the fifteen female cases in our series harbored rather systematic delusions of persecution, and all three systems had a sexual tinge.

This fact, allocated with the not infrequent tendency to disorder of glands of internal secretion in certain cases, ought to provide a fruitful field for psychoanalytic hypotheses.

12. Hallucinations, as a rule auditory, were observed in something like 60 per cent to 70 per cent of the cases: there are *à priori* reasons (Wernicke) for relating these with the unpleasant delusions characteristic of the group; but, whether the false beliefs irradiate over to incite the hallucinations, or whether the hallucinosis is a prime factor in producing the false beliefs, must remain an open question: statistically we should be forced to favor the former process.

13. The post mortem data throw some light on the negative definition of our group (see paragraph 3 *supra*). There appears to be little or no evidence that the metabolic disorder, if there be such underlying this group, tends to brain wasting.

14. Our study of the distribution of certain chemically ill-defined lipoids (or pigments, as we have called them) shows that age plays some part in the amount of deposits, perhaps more in the neuroglia cells than in the nerve-cells, and least of all in the perivascular phagocytes.

15. All cases living three years or more after onset of symptoms show more or less marked accumulations of pigment in neuroglia cells; the same cases show a greater variability in the nerve-cell accumulations; occasionally such a three-year or over-three-years case will show a negligible amount of pigment in perivascular phagocytes.

16. These pigment-findings are in substantial agreement with those of Southard-Mitchell, 1908:

(a) "Perivascular cell pigmentation almost uniform in different areas of the same case." The present series presents only two instances of marked variability from area to area.

(b) "Neuroglia cell pigmentation * * * varies more or less directly with age." Our present group presents more variation than did the former; there is however no absolutely negative case over 46 years of age.

(c) "Nerve-cell pigmentation is not a function of age." Two cases of 50 years or more showed no appreciable amount of pigment, and three others showed but slight amounts. The

variations in amount within a given brain are more striking than the variations shown by the neuroglia cell pigments.

17. That these three loci for the deposition of pigment tend at last to a species of saturation is indicated by the fact that the *even* degrees of moderate or of marked pigment deposit in all loci begin to appear in the later years of life (one case at 49 years, one at 56, and the rest from 59 to 75 years).

18. The fresh point of view thus obtained for the problem of involution-melancholia by our study of fifth-decade insanities may be stated as follows:

Involution-melancholia has been regarded as possibly akin to manic-depressive insanity or even identical therewith or as possibly something quite different. Perhaps the majority of psychiatrists would regard it as a disease akin to manic-depressive insanity but modified by climacteric or presenile changes and distinguished from manic-depressive insanity by the peculiar tendency to depression which has given it its name. The novel feature of our investigation has been to study the age-factor. We have studied unselected cases arising in the fifth decade of life, excluding all coarse organic cases of brain lesion. Our resultant group is, we believe, although small, otherwise ideally representative of the conditions underlying mental disease at this age-level. Our group includes a sufficient number of the familiar cases of involution-melancholia as well as cases of delusional insanity without melancholia. The striking fact is that the *melancholia cases* prove also *delusional*. In so far as our group is representative of the fifth decade, we believe that the essential *psychopathia involutonis* is characterized by delusions, that in the large majority of cases melancholia is a feature superadded to the delusions, and that in a smaller majority of cases hallucinosis also occurs. The fact that melancholia may assert itself as the most prominent symptom in the clinical foreground fails to controvert the possible genetic importance of the delusions. As to the cause of *psychopathia involutonis*, it is easy to invoke the glands of internal secretion; and of their disorder there is actually some sign in a number of cases. Whether such disorder or some unknown factor determines the over-pigmentation (lipoid accumulations) in the cortex above noted, and whether these deposits have a direct relation to the symptoms must rest with the future.

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THE DISTRIBUTION OF THE LESIONS OF GENERAL PARALYSIS.*

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This analysis of the distribution of the lesions in general paralysis was taken up with the hope of adding to the data of the anatomical distribution of the lesions and possibly of throwing some light on the mechanism of infection. The gross appearance of the brain gives by means of the pial thickening and atrophy some indication of the relative severity of the process, but microscopic examination will in many instances show that the meningeal involvement is not a safe guide to the amount of cortical damage, and atrophy is at best a coarse index which reveals only the more advanced changes.

Tuczek on the basis of work done by the Weigert myelin sheath method arrived at the conclusion that the anterior part of the brain was most severely attacked, that the vertex was prone to suffer early and that the occipital region was less involved though not always free. Shaffer using the same methods suggested that the brunt of the lesions was borne by the association centers leaving the sensory cortices relatively free thus grouping the attack as a sort of system disease. Kaes held that the process was an outspoken diffuse one spread over the whole cortex, but variable in its intensity. Alzheimer on the data obtained from his classical study, and based on a wide variety of methods including cell and glia preparations, concludes that in the rapidly progressive cases the lesions are widespread and of approximately equal intensity. In the majority of the cases, however, the orbital gyri suffer the most and next in order the frontal pole and frontal half of the convexity. The occipital pole is commonly though not always the region showing the least severe involvement. In long standing cases with advanced dementia, marked paresis, etc., the distribution is again widespread. Mott has made the suggestion that the distribution is due to the relation of the venous return from

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

the cortex into the superior longitudinal sinus and that those areas in which the return system favors congestion are the earliest and most severely attacked.

For the present study the index used was a combined one based on the amount of perivascular infiltration and the degree of stratigraphic disturbance. This method is open to the objection that it does not take into account the glial changes nor the less prominent cell losses which, when diffuse, may be of considerable amount and yet not readily recognized except by accurate cell counts which would prove too laborious for such a large series of cases as the present.

The routine adopted in the laboratory of the Worcester State Hospital includes sections fixed and stained by three standard methods for the display respectively of the cell, fiber and glia content from six areas of each hemisphere in all cases except those reserved for more intensive or special study. These areas are precentral, postcentral, frontal, temporal, occipital and the hippocampus and cornu ammonis.¹

The material used was for the most part from material fixed in alcohol and stained by Nissl's method. The remainder was formalin material and was stained in thionin. All sections were cut in paraffin at 10μ and should be fairly comparable.

In order to reach some comparison of the severity of the involvement in various areas some empiric standard was necessary, and the following scheme was adopted. A zero indicates those areas where the lesions were of such minor grade that one would hesitate to accept them without further data as diagnostic of paresis. In this group the meningeal lesions were purposely omitted from consideration. A single plus sign designates areas with lesions of sufficient severity for ready diagnosis, but without noticeable cell disturbances. A double plus sign refers to sections showing advanced perivascular infiltration with or without slight disturbances of lamination. A triple plus sign indicates advanced vascular lesions with distinct stratigraphic disturbance.

Fifty cases were reviewed in this way and the results may be recorded in tabular form.

¹ The exact location of these sections is diagrammatically indicated and the technical methods are described in an article by the writer in the *Am. Jour. of Insan.*, Vol. LXIX, No. 2, Oct., 1912.

No.	Case	Pcl.	Pocl.	F.	T.	Occ.	C. A.
1	XIV-38	++	+++	+++	+++	+++	++
2	XIV-63	++	++	+	+	0	+++
3	XV-23	+	+	+	+	+	++
4	XV-24	+	+	+	+	+	++
5	XV-31	++	++	++	++	0	++
6	XV-33	++	++	++	++	+	+++
7	XV-34	+++	+++	+++	+++	+	++
8	XV-35	++	++	+++	++	0	+++
9	XV-36	+	+	+	+	0	+
10	XV-39	++	++	+++	++	0	+++
11	XV-41	+	+	++	++	0	++
12	XV-47	++	++	++	++	+	+++
13	XV-51	++	++	++	+	0	++
14	XV-52	+++	+++	+++	+++	+++	+++
15	XV-53	+++	+++	+++	+++	+	+++
16	XV-55	++	++	+++	++	0	+++
17	XV-61	+++	+++	+++	+++	+	++
18	XV-64	++	++	+++	++	0	++
19	XV-70	++	+	++	++	0	++
20	XV-72	+++	++	+++	+	0	++
21	XV-76	+++	+++	+++	++	+	++
22	XV-83	+++	+++	+++	+++	+	++
23	XVI-4	+	++	++	++	0	+
24	XVI-7	+	+	+	+	0	+
25	XVI-9	+	+	+	+	+	+
26	XVI-14	++	++	++	++	++	++
27	XVI-15	++	++	++	+	0	+
28	XVI-26	++	+++	+++	++	0	++
29	XVI-33	++	++	++	++	0	++
30	XVI-45	+	+	++	++	++	++
31	XVI-47	++	+	+	++	0	++
32	XVII-1	+++	+++	+++	+++	0	+++
33	XVII-8	++	+	+++	++	0	+++
34	XVII-12	++	+++	+++	++	++	+
35	XVII-15	+++	+++	+++	+++	+++	+++
36	XVII-19	+++	++	+++	++	++	+++
37	XVII-22	+++	+++	+++	+++	++	++
38	XVII-24	+	+	+	+	+	+
39	XVII-27	+	+	++	+	+	+
40	XVII-35	++	++	+++	+++	++	++
41	XVII-42	++	+	++	+	0	++
42	XVII-58	+	+	+	+	0	+
43	XVII-62	+++	+++	+++	+++	+++	+++
44	XVII-64	++	++	+++	++	+++	+++
45	XIII-2	+++	+++	+++	+++	+++	+++
46	XIII-5	++	++	++	++	+	++
47	XIII-9	+++	+++	++	++	++	++
48	XIII-13	++	++	++	+++	++	+++
49	XIII-18	+	+	++	++	+	++
50	XIII-19	+++	+++	+++	+++	++	++
Totals.....		103	101	117	104	59	111

The totals by columns while not accurate in their representation still show the relative severity of the process in the six areas under consideration, and the figures indicate fairly clearly that the average intensity follows Alzheimer's description of the distribution in the typical case. The cases of this series were not selected and hence probably include those of rapidly progressive type and those of more chronic course. A further review of these points is planned.

The relatively marked involvement of the hippocampal area—standing next to the frontal in the tables—is at first sight rather striking and suggests an almost selective vulnerability for this region which is of especial interest when one considers the frequency of epileptiform attacks in general paralysis and the association of lesions of the cornu with acquired epilepsy.

It is worthy of note that in the fifty cases reviewed here no cases of clearly unilateral distribution were encountered. Some showed marked variation in severity between the sections representing the same gyrus in the two hemispheres, but in none was this consistent throughout the six areas studied. No cases were encountered where the lesions seemed to be distinctly focal in type.

The typical topographic distribution on which rests without doubt the symptom complex of the typical case suggests that in all except the rarer forms the attack cannot be considered as haphazard or accidental, but rests probably on an anatomical basis.

Shaffer's conception of paresis as a system disease attacking the association centers is not tenable.

Mott's conception of the relations to the venous return to the longitudinal sinus could hardly be applied to the hippocampus with its relatively free venous return.

Histological studies have shown that general paresis cannot be considered as a selective vascular disease, but that there is accompanying the perivascular infiltration a marked amount of cell degeneration and destruction at some distance from the diseased vessels.

The demonstration by Noguchi and Moore of the treponema pallidum in the brains of cases of general paralysis necessitates the abandonment of the conception of this disease as a pernicious metabolic disturbance set up by the syphilitic infection, *i. e.*,

parasyphilis, and makes it necessary to consider distribution from the standpoint of a true infection amenable probably to the known factors governing channels of infection in other diseases. With this idea in view and excluding accidental distribution as above suggested one might consider the problem from the standpoint of: first, vascular supply both arterial and venous; second, lymph channels; third, direct invasive spread; fourth, selective resistance of given areas; and fifth, local structural factors.

The fourth consideration would seem to be excluded by the lack of clear-cut system involvement. The lesions do not observe the boundaries of given fields, but are spread over an area which contains several types of cortex. The third class would seem to fit more accurately the curious cases of local atrophies with fairly sharp boundaries which are occasionally met in atypical cases, but scarcely covers the typical group.

Among the local structural factors must be considered the cerebrospinal fluid which shows cellular evidence in paresis suggesting its invasion. No report of recovery of spirochæta from the fluid in this disease has yet come to the writer's notice, though some negative reports are at hand.

The lymphatic supply of the brain stands in such close relation to the blood vascular system that they may be considered together.

The vascular supply of the anterior parts of the brain is derived from the two main branches of the carotid artery, *i. e.*, the anterior and middle cerebral while the occipital lobe—that part of the brain where the lesions are, in typical cases, less pronounced or even absent—receives its blood supply from the posterior cerebral which in turn arises by the bifurcation of the basilar. The circle of Willis with its one anterior and two posterior communicating arteries forms a path of anastomosis uniting the circulation of the anterior group with the posterior and of the right and left halves. Observations on only a small series of brains will, however, convince one of marked variations in size of the communicating branches, especially the posterior group, which must render the freedom of anastomotic interchange very variable. Recently some experimental work has been recorded by Kramer tending to show that this anastomotic pathway is probably only active when marked variations in pressure, such as those associated with pathological vascular conditions, exist and that under normal

physiological conditions it does not serve for any marked interchange of blood from one system to the other. This conclusion was reached after injection experiments, and the writer has been able to confirm the results in a series of cat brains. The method consists in the injection, given slowly to avoid introducing too great an element of pressure, of a strong solution of methylene blue into the carotid artery of one side and the immediate killing of the animal and removal of the brain. Under these conditions in the successful experiment the frontal fields and the anterior and middle portions of the convexity of one hemisphere will be found stained together with a small part of the opposite frontal region adjacent to the interhemispheric cleft, while the posterior part of the hemisphere on the side of the injection and all of the other hemisphere with the noted exception will be entirely free from gross visible evidence of the effect of the stain. In other words the stain injected into the carotid has reached the distribution of the two branches of this vessel and has been confined to this area except for a small amount which has passed through the anterior communicating artery into the opposite anterior cerebral. There is no evidence of active flow through the posterior communicating vessels. Kramer illustrates the mechanism of this distribution by means of a glass and rubber tube model of the circle and its branches and shows in this also that the stream fails to pass through the representatives of the posterior communicating arteries while the pressure in the two sides of the system remains equal.

In one of the experimental cats a small amount of blue coloring was in evidence in the anterior part of the hippocampal region. This led to an examination of the vascular supply of this area in a series of human brains. The anterior choroid artery arises from the middle cerebral or from the internal carotid, or as in one side of one brain examined from a large posterior communicating artery near its point of junction with the carotid system and after a short course gives off a prominent branch which penetrates the uncus hippocampi and supplies its cortex. This forms then a path of direct communication between at least a part of the hippocampal region and the carotid system of arteries and for the purpose of determining the extent of this supply recourse was had to methods of injection. In all, six brains were injected. Four

of these received colored solutions and records were taken from immediate sections. The two others received injections of colored gelatin and were cut after fixation of the injection mass. In one of each series the injection was given unopposed through the anterior choroid vessel. In the others Beevor's method of simultaneous injection at equal pressure was employed.

In brief the injection experiments showed the cortex of the uncus to receive its supply from this branch which also supplies the central white core of the cornu ammonis for a variable distance backward. The very apparent difference in the extent of injection in those brains in which the injection entered the anterior choroid artery only and those in which this was balanced by simultaneous injection of the posterior cerebral leads one to conclude that there probably exists a free anastomosis between the arterial twigs of the two systems at this point which in turn would imply a free anastomosis of the perivascular lymph channels.

These findings show the hippocampus to be within reach of infection traveling by the branches of the internal carotid and its associated lymph spaces and together with the facts of the general distribution of the lesions in the typical case suggests the carotid system as a path by which the infection might reach the areas of the brain most severely attacked. This conception does not of course explain the greater involvement of the course of the anterior cerebral as contrasted with that of the middle cerebral, but other factors such as the venous stasis suggested by Mott may also influence the spread of the process. The *treponema pallidum* has been shown to remain in the arch of the aorta over a long period of years and similar persistence in the cerebral vessels or a seeding to the cerebral system from such resistant foci gradually overcoming the resistance of the brain to invasion might readily be considered as part of the mechanism of the latent period between the syphilitic infection and the onset of the symptoms of general paresis.

Résumé.—A graduated review of the intensity of the lesions of general paralysis in six areas of each hemisphere of 50 unselected cases indicates the following order of severity—frontal, hippocampal, temporal, precentral, postcentral and with markedly less involvement the occipital. The circle of Willis does not act as a path of ready communication between the carotid and vertebral

systems. The hippocampal region receives a part of its blood supply from the carotid group thus including within the distribution of the branches of the carotid those areas where the lesions have been found to be prominent and suggesting this vascular system as the basis for the distribution in the typical case.

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AMYLOID DEGENERATION OF THE BRAIN IN TWO CASES OF GENERAL PARESIS.*

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In two recent communications (1911 and 1912) Mignot and Marchand¹ reported certain alterations in vessels of the cerebral cortex of a general paretic and extravascular lesions of like nature, deposits of variable size in the vicinity of the affected vessels, which displaced or destroyed by pressure the surrounding nervous elements. The walls of the affected vessels were thickened, homogeneous and refractile, their lumina narrowed or obliterated. These changes, while implicating some of the larger vessels, involved chiefly capillaries and pre-capillaries. In the larger vessels the process began in the media; in the capillaries it first appeared in the adventitia. The intima, though not immune, was less frequently a starting point. This vascular tunic seemed to offer a greater resistance to the invasion, for in many instances it remained unaffected long after the other portions of the vessel wall had undergone a complete change. The physical characteristics and tinctorial reactions of the extravascular deposits were identical with the changes in the walls of vessels. The whole process was interpreted as an amyloid degeneration. More recently (1912) Sioli² reported a case, also a general paretic, which presented alterations of the same character, though here not disseminated, as in the instance first mentioned, but focalized on the surface of the right temporo-sphenoidal lobe in such manner as to be mistaken at autopsy for intracranial neoplasm. Here, too, the microscopical findings were looked upon as the expression of an amyloid degeneration, or, to quote exactly, as an "*amyloidähnlich Degeneration im Gehirn*." These cited cases, in so far as the vascular alterations and the supposedly extravascular deposits are concerned, compare well with the few cases

* Presented in abstract at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913. Westborough State Hospital Papers, No. 18.

of like nature recorded in the literature, dating from Billroth's⁴ observations in 1862.

In the literature these changes have been described in turn as *gelatinous*, *waxy*, *glassy*, *colloid* and *hyaline* degeneration of the brain. They have been described even under the rather indefinite heading *sclerosis* (Eppinger⁵), though in this particular instance the alterations were confined chiefly to the vascular apparatus—the affected vessel walls exhibited the characteristic physical and staining properties of hyaline. Finally, as noted above, the process has been more specifically classified as *amyloid* degeneration, but a possible transitional or pre-stage of amyloid had been earlier suggested (Arndt,⁶ Holschwenikoff,⁷ Alzheimer,⁸ *et al.*).

The greatest number of the recorded observations have concerned cases of general paresis. Other mental conditions with which these changes have been associated are imbecility, imbecility with epileptiform convulsions (Wedl,⁹ R. Maier,¹⁰) psychosis undetermined but probably the mental disorder of active cerebral lues (Alzheimer⁸), senile dementia (Vorster¹¹)—though here the interpretation of the reported observation is looked upon askance*—and hydrophobia (Wasilieff,¹² Benedikt,¹³ Kolessnikoff¹⁴). Similar alterations have been reported among the microscopical findings on a subject dying of a nervous disease, a case of amyotrophic lateral sclerosis (Spiller¹⁵). The well-described findings of Holschwenikoff⁷ were made on a subject which, so far as known, had not suffered from any psychosis, and the nineteen cases reported by Neelsen¹⁶ were also without a history of mental disease; they were found among a group of seventy-nine brains from persons of various ages, chiefly elderly subjects.

The identity of the alterations in Holschwenikoff's case with the process under discussion, however, has been questioned (Sioli¹⁷), on the ground that they are better classed with the more common hyaline degeneration of arteriosclerotic vessels. As a defense for his attitude, Sioli sets forth the presence of calcareous deposits in the affected areas of Holschwenikoff's case which

* Since this paper was presented at the Niagara Falls meeting of the Association the writer has received a reprint of Ziveri's case,¹⁸ a presenile with amyloid changes identical with the vascular alterations described in Case II of this paper.

to him is *prima facie* evidence of their arteriosclerotic nature. Similarly, doubt has been cast on the findings of Neelsen (Alzheimer⁶). In Neelsen's nineteen cases conversion of vessel walls into a homogeneous substance was shown only for short stretches and this confined to the vessels of the outermost cortical lamina, most frequently at the points of branching, sometimes involving one side of the vessel, sometimes affecting it in an annular manner, but always sharply delimited. Alzheimer contended that the findings of Neelsen could not be included as examples of colloid degeneration (meaning the process under discussion), but must be considered as the hyaline change which arteriosclerotic vessels so frequently undergo. Moreover, it was pointed out that not only was the involvement greater in colloid degeneration than in ordinary hyaline degeneration of vessels, but that there were certain tinctorial differences. Alzheimer entered a plea for the use of *colloid* degeneration as a designation for the process here discussed, chiefly, however, to avoid confusion with the hyaline degeneration of arteriosclerosis. Among the things which he emphasized was the albuminous nature of the deposits and the possibility that they represented a pre-stage of amyloid conversion.

Colloid degeneration has been the favorite term with which these very striking changes have been designated, but it should be stated that where this term has been employed the old v. Recklinghausen conception of colloid is meant. v. Recklinghausen's colloid,¹⁷ as is known, includes mucoid hyaloid and amyloid degeneration. Colloid degeneration as now understood is restricted to certain altered cellular (epithelial) secretions, such as the substance found in the acini of the thyroid gland in disease states and advancing age, the homogeneous substance of retention cysts of the kidney, casts of the urinary tubules, the similar substance encountered in some ovarian cysts, certain adrenal tumors and in many tumors of other organs.

The varieties of explanations as to the origin and chemical nature of this conversion of vessel walls into homogeneous masses and of the other homogeneous deposits which have been considered as extravascular, even surpass in number the terms employed to designate the process. Thus we find the changes interpreted as a swelling and conversion into colloid substance of the adven-

titial and intimal cells which subsequently are welded together to form larger masses (Arndt,* Schüle¹⁸); as originating from a diffuse interstitial encephalitis with an infiltration of colloid substance into the proliferated elements of the cellular glia and the proliferated cells of vessel walls (Billroth,* Magnan¹⁹); as an albuminous degeneration of blood cells within the lumina and perivascular spaces of the affected vessels (Adler,²⁰ Oeller²¹); as a waxy degeneration not only of the proliferated cells of the vessel wall but also of the infiltrated cells of the perivascular space (Lubimoff²²); as products of post mortem origin (Wedl,* Adler²³)*. As the result of various dyscrasias and acute processes, also of local circulatory disturbances, particularly increased blood pressure (Holschwenikoff²⁴); as albuminous deposits undergoing further chemical elaboration—a pre-stage of amyloid degeneration (Alzheimer²⁵); as a deposition of hyaline substance in the walls and lumina of vessels in a telangiectic area (Beadles²⁶); as a transitory stage of luetic nodular periarteritis (Witte²⁷) as a deposition of amyloid substance in a brain previously injured by a subacute meningo-encephalitis (Mignot and Marchand²⁸); and, finally, as the terminal stage of general parietic changes, comparable to the local amyloid changes in other chronically inflamed organs (Sioli²⁹).

It is probable that some of the reported observations, even some of those to which reference has been made, cannot be considered as unquestionable examples of the process here discussed, criticisms of which may be found in the cited papers of Alzheimer and Sioli, and in other contributions to the literature of this subject. It is also quite probable that processes of the same character, particularly in those instances where there has been little doubt as to being confined to blood vessels, are described under other rubrics. So appears to the writer the case reported by Witte under the title, "*Ueber eine eigenartige herdförmige Gefässerkrankung bei Dementia paralytica*" and Beadles' case, "A telangiectasis of the Left Frontal Lobe with Epileptiform Convulsions."

* Interesting in this connection is Stilling's³⁰ interpretation of the origin of corpora amylacea, namely, as of post mortem origin, attention to which is called for reason of the possible relationship of corpora amylacea and the homogeneous deposits in the cases reported in this communication, discussed below.

It is interesting to note that, almost universally in recent papers, attention is called to the lack of any appreciable cellular and fibrillary reactions following upon these peculiar changes which, as in the case reported by Sioli, may reach enormous proportions. Even where the process is comparatively mild, restricted and apparently of recent origin, as in Case II of the present communication, there are few tissue reactions which may not be just as well explained as resulting from other causes. This is in striking contrast to the reaction commonly observed around the focalized deposits of the split products of pathological metabolism (*Abbau Produkte* of the Germans), where there is often not only a rich influx of phagocytic cells (*Abraumzellen*) of mesodermic and glial origin, but also, depending upon the age of the process, more or less glial fibrillosis. Whatever changes are shown by the nervous elements as the result of the deposits are overwhelmingly pressure changes—atrophies and displacements, and, in consequence of these, frequently a complete disappearance of nervous structures over areas of greater or less extent.

Though mindful of the views concerning the origin of amyloid bodies from myelin sheaths and other components of nervous elements, the case of myoclonic-epilepsy reported by Lafora,⁶ Lafora and Glueck,⁷ is the only instance known to the writer where amyloid, in the form of corpora amylacea, has been found within ganglion cells.* Stürmer,⁸ in a recent defense of the glial origin of corpora amylacea in the central nervous system, prefers to consider the ganglion cell inclusions in Lafora's case as deposits resulting from cell degeneration of another nature rather than as amyloid degeneration of ganglion cells. Stürmer's objections, however, are not overconvincing, especially in view of what he lays down as a positive test for corpora amylacea, with which the structures reported by Lafora seem to comply. Looking, then, on the process discussed in this paper as an amyloid degeneration and the corpora amylacea as a form of this type of degeneration, Sioli's objections to Holschwenikoff's case, too, become less serious, if one accepts Siegert's⁹ classification of the familiar amyloid bodies of the central nervous system into

* Mignot and Marchand, l. c., report amyloid deposits in some of the ganglion cells in their case, but this was of the nature of the deposits in walls of affected vessels.

corpora versicolorata and *corpora flava*. The latter group, according to Siegert, frequently undergoes calcification ("*sie verkalken sehr häufig*"), while the former never undergoes such change ("*sie verkalken nie*").

These observations on the corpora amylacea are interpolated for the reason that their characteristic iodine reaction is duplicated in some of the particular homogeneous deposits of which this paper treats. One may infer from well-described cases that the chemical composition of these very striking deposits is variable, for a differential staining of them has been made (Holschwenikoff,⁷ Alzheimer,⁸ Sioli⁹). Moreover, it seems agreed that corpora amylacea of the central nervous system, as well as amyloid deposits of other forms elsewhere in the body, are principally nitrogenous compounds, chiefly albuminous unions of high molecular valence. So that whether or not one accepts the gliogenic, neurogenic, lymphogenic or hemogenic theories of the origin of corpora amylacea or other forms of amyloid, the suggestion of a pre-stage of amyloid degeneration for the process reported, or an *amyloidähnlich* degeneration, even an unqualified amyloid degeneration, may not be far of the mark.

With this sketchy presentation of some of the views concerning these peculiar changes and the principal contributions to the literature, we may pass on to the writer's personal observations on the two cases coming to autopsy at Westborough State Hospital.

CASE I.

Summary.—A bachelor of 50, formerly a lumberman in Western camps, later a bartender in frontier towns and finally, after considerable roaming about and progressively descending in the economic scale, was dishwasher in a restaurant. He had used alcohol to excess; denied lues, but admitted gonorrhœa and promiscuous sexual indulgence. For the past five years had lost his grip on things and failed in his ability to support himself as well as formerly, yet he thought he was "getting on fine." Shortly before admission he was depressed and gave utterance to certain somatic delusions—heart and pulse had ceased beating, etc. On admission, euphoric, considerable mental dilapidation; characteristic general parietic speech disorder; contracted non-reacting

pupils; unsteady gait, general tremor and jerky tongue. Positive Noguchi in blood serum. During hospital residence, continuously grandiose; marked memory disturbance; repeated epileptiform seizures; loss of rectal and bladder control; terminal lobar pneumonia; death. At autopsy, marked pial opacity, cerebral atrophy, multiple miliary gelatinous areas in cerebral cortex, granular ependymitis; lobar pneumonia; pyelonephritis, cystitis. Microscopically, the classical histopathological lesions of general paresis; numerous homogeneous deposits confined to the mesoblastic apparatus of the cerebral cortex, the marrow seldom involved, while sections from basal ganglia, pons, cerebellum and cord were free.

W. S. H., No. 9455, an unmarried man of 50, was admitted February 27, 1911, on a transfer from Boston State Hospital (Psychopathic), where he had been a patient for four days.

Data of family history is meagre. The patient's parents were born in New Brunswick, dying at an advanced age without having suffered from mental or nervous disease. Mental and nervous diseases were denied for all other known members of the family.

Of the patient's previous history there is also little information. A brother, a fairly intelligent man, stated that when a child patient suffered an injury to the penis, the result of a burn, which explains the mutilating scar seen on the prepuce; that he had no severe illness as a child and in general was much like other boys of his community. As a youth he worked on a farm, doing good service, but on reaching his majority, some thirty years ago, he went to the Western part of the United States; since then he had not been in close touch with his relatives. Out West he worked as a lumberman in many camps and later, for several years, was a bartender in Western towns, moving about frequently. Five years ago he came East to Boston. Since he has lived in Boston he has had several places of employment, how many, neither he nor his brother can state, but each succeeding position has been lower in the economic scale than the preceding, the last as dishwasher in an ordinary city restaurant. He was of the opinion, however, that he was making progress; to use his own words he was "getting on fine." He had used alcohol freely, and judging from the shameless manner in which he related his sexual experiences, had cohabited promiscuously. Gonorrhœa several years ago; lues denied. Early in February, 1911, informant (brother), who had not seen patient for about two years, noted a marked impairment of memory; that he exhibited considerable general mental dilapidation, and, moreover, that he was despondent over the state of his health. At this time he talked a great deal of dying, saying repeatedly that his heart and pulse had stopped beating. February 23, 1911, the patient's relatives, fearing his increasing despondency might lead to some act of self destruction, reported him to the police, whereupon he was

sent to Boston State Hospital and four days later transferred to this hospital (W. S. H.).

In the certificate of commitment there is a statement to the effect that "he has been progressively deteriorating for some time."

The abstract from Boston State Hospital is, in part, as follows:

"*Orientation.*—*Person*, impaired. Did not know his age nor could he tell when he was born. *Place*, impaired. Knew this was Boston, but had no idea of suburb or general location of distance. *Time*, impaired. Did not know year; said February 22d, Wednesday. (Really Thursday, 23d.)

"*Grasp.*—*Surroundings*, impaired. Called this a hospital, but did not know name. Thought it was for good people. Knew position of physician, but did not of nurse. *Education*, impaired. Was able to read and write 7 x 8 he was unable to calculate, nor could he do any but the simplest calculation, such as 2 x 3. In naming five cities, said St. John's, Michigan, Missouri, New Orleans, Kentucky. Could not tell who was present king of England or president of this country.

"*Memory.*—*Remote*, impaired. After leaving school, stated he worked twenty years as farmer. Then he went West, being there thirty-five years as a sawyer of lumber and saloon keeper. Cannot give any details. . . . *Recent*, impaired. Thought he came here this morning. Does not remember seeing physician before, when he came this afternoon and had only recently seen the examiner. He cannot give the details of how he happened to get here.

"*Hallucinations.*—Denied and no evidence of any.

"*Delusions.*—He expresses a feeling of well being; said he was never as happy in his life; was going out to-day to work, filling a position he had recently obtained; that he was one of the best sawyers that ever was and the first to use a certain kind of saw. Thought he would like to learn how to run an automobile.

"*Emotional Tone.*—One of elation.

"*Flow of Thought.*—Nothing particular, excepting inclination to go into unnecessary detail about unimportant matters.

"*Motor Phenomena.*—Facial expression was one of elation. Quiet and remained in bed without trouble.

"*Physical Examination.*—Contracted, non-reacting, irregularly outlined pupils; right smaller; marked speech impairment; tremors of tongue and hands; absent knee-jerks; swaying in Romberg, tremors in writing.

"*Provisional Diagnosis.*—General paresis."

Here.—On admission, in addition to the physical disorders noted above, ankylosis of distal articulation of right ring finger, hallux valgus (left); mutilation of prepuce from an ancient injury; recent scratch on right side of neck three inches in length; soft systolic murmur heard at apex; pulse rapid and full; firm radials; other trunk findings negative. Reads No. 25 D test type with right eye, No. 2 D with left. Argyl-Robertson pupil, *arci seniles*. Hearing tests not satisfactory—patient not co-operating. Impairment of ability to differentiate certain common odors; hypo-

geusia; diminished pain sense of skin. Unsteadiness of gait, heels planted first and with force; co-ordination movements poorly executed; muscular development good; tone fair; tremor of closed eye-lids and coarse tremors of hands; patellar reflexes absent; no clonus; doubtful Babinski on each side. Speech was slow and drawling, with elision of syllables and frequent clonic repetitions of the last syllable of words. The handwriting was progressively ataxic, with syllables or words left out.

He was imperfectly oriented; thought he was in a New York hospital, but did not know what kind of a hospital. It did not disturb him to be told that he was a patient in an institution for the insane, to which he replied, "I was never better in my life. I am well mentally and physically." He was unable to give an account of the happenings in his life during the past few weeks, and the statements which he made concerning the remote past were very conflicting. He first said that he was 47 years old; later that he was 28; that he went to college for five years, entering when he was ten and leaving when twenty, but he could not give the name of the college. He was unable to perform the simplest examples in arithmetic, and his knowledge of the commonest known historical events was very defective. He talked freely of his great abilities: "I expect to make a million dollars, as I am well and hearty, I am going into the restaurant business. I have got \$5000 ahead in the Boston Bank of South Boston. It is drawing four cents a week on each dollar," etc. Notwithstanding his claims as a man "full of mental and physical possibilities," he could realize no inconsistency in this with his last employment, dishwashing. He minimized his alcoholic indulgences, said he used tobacco moderately and though he admitted gonorrhœa, he had not contracted syphilis, because he made it a point to cohabit only with married women, entering into many disgusting details. Throughout the interview he exhibited considerable elation and a marked sense of well-being.

March 28, 1911. During the past month he occasionally protested against remaining here, but generally he seemed well satisfied with his surroundings. Memory defect was the most marked mental symptom. Almost daily he made the same requests and told the same stories as though they were new. He never could tell how long here, nor give the name of his physician, the attendant or of patients with whom he conversed frequently. To-day he complained of a sensation of coldness in the right half of his body.

April 17, 1911. He was still disoriented and exhibited just as poor memory as previously noted. Though apparently duller, he insisted that he was not insane and could see no reason why he should remain here. He said he had \$4000 in bank which brought him in five cents, evidently meaning five per cent, but when his attention was called to the statement he apparently could not comprehend the difference between a deposit of \$4000 which yielded five cents and one of like sum that yielded five per cent. He had not the slightest idea of current events. Speech defect was more pronounced than at previous interviews; test phrase more poorly executed. During the last twenty-four hours he has developed an attack of diarrhœa.

May 27, 1911. Since the last note patient has been confined almost constantly to bed, having become very unsteady on his feet and grown worse, mentally and physically. At present he is very dull, says little, not even responding to greeting of physician. He has lost in weight.

July 7, 1911. Following the last note he was less dull and seemed stronger and was again permitted to be up and dressed. He was again euphoric, discussing freely his prowess and expectations. He usually replied to the physicians' greetings with, "Feeling fine. Get three good meals a day; nice bed to sleep in."

July 14, 1911. To-day very untidy and confused; mumbles almost constantly in an unintelligible manner and attacked the attendant without apparent provocation.

August 22, 1911. In bed; very feeble; apparently clouded; speech content rarely intelligible, mutters a great deal to himself.

September 21, 1911. Very noisy, shouts and screams at the top of his voice; throws his arms wildly about and beats himself on the head, particularly the face.

September 25, 1911. A ballanitis has developed, for which surgical interference is necessary.

September 29, 1911. Again noisy as on the twenty-first of the month; leaves bed, carrying along the bed clothing, meanwhile much confused; very tottery and falls frequently when he attempts to run around the ward.

October 4, 1911. In two attempts to leave the bed he was so weak that he fell, each time producing severe bruises.

October 22, 1911. Epileptiform seizure.

November 3, 1911. The patient has failed very appreciably since last note and is now constantly untidy.

November 30, 1911. Within the last twenty-four hours he developed a severe series of epileptiform convulsions; twenty-three distinct attacks have occurred during this period.

December 25, 1911. During the past three weeks numerous epileptiform seizures have occurred. Failure has been rapidly progressive. He has been unconscious most of the time.

December 28, 1911. To-day temperature dropped to 94.2 F. (rectal); previously it had been 102.6 F. Respirations are now fifty-two per minute; bubbling râles may be heard rather generally over the lungs and there is dullness of the left lower lobe and in the region of the left axilli. Death at 10.55 p. m. Autopsy fifteen hours post mortem.

Anatomical Diagnosis.—General paresis. Increased density of calvarium, dural congestion, chronic leptomeningitis, hydrocephalus ex vacuo, cerebral atrophy, multiple miliary gelatinous areas in cerebral cortex, moderate cerebral arteriosclerosis, granular ependymitis; congestion and chronic leptomeningitis of cord; lobar pneumonia; hepatic congestion; pancreatic congestion; splenic congestion; pyelonephritis, cystitis.

Abstract of Autopsy Protocol.—The dura is congested and tense, presenting along either side of the longitudinal fissure, at the vertex, herniæ of

Pacchionian granulations. The whole brain is congested, the pial vessels markedly engorged. The pia, besides, is very opaque and edematous. Here and there over each convexity of the cerebrum are cyst-like accumulations of fluid in the pia which have compressed the underlying gyri. Some of these areas in their greatest extent exceed the diameter of a fifty-cent piece. The pial opacity is distributed over the entire convexity, with exception of the tips of the occipital lobes, which remain relatively clear, over the mesial surfaces of the frontal lobe, the base of the cerebrum and inferior surface of pons, the base of the cerebellum and over the superior worm. The opacity is most pronounced over the frontal convexity and mesial surfaces of the frontal lobes which are welded together. The cerebral gyri exhibit some wasting, particularly those of the frontal lobes, where there is considerable gaping of sulci, and also the central convolutions, particularly their upper two-thirds. Section reveals in cortex of frontal, parietal, occipital and temporal gyri innumerable small, grayish gelatinous masses which look not unlike boiled sago, though considerably smaller, the largest scarcely exceeding in diameter that of a pin-head. Some of the granules are apparently confluent, but by far the great majority are discrete. No such alterations are found in the basal ganglia, mid-brain, pons, medulla or spinal cord. . . . The brain with pia attached and before section weighs 1360 gm.; the skull capacity after the method of Rosanoff and Wiseman is 1620 cc.

The other gross findings noted in the anatomical diagnosis offer no special features that need to be gone into here. It might be noted, however, that nowhere in the trunk organs were gross lesions encountered which were in anyway comparable to the deposits found in the cerebral cortex. It may be added, also, that the subsequent microscopical examination of the trunk organs revealed no changes suggestive in the least of an amyloid degeneration.

Microscopic Examination.—For the reason just stated, the microscopical report is limited to the central nervous system. The typical histopathological changes of general paresis—perivascular infiltration with plasma cells, lymphocytes and other foreign cells heavily laden with lipoid granules in the pia and cortex, cortical vascular proliferation of the reticular and aggregative types, numerous rod cells, luxuriant fibrillary and cellular gliosis, destruction of ganglion cells with consequent disturbance in the cortical architecture—were abundantly shown in sections prepared after the Nissl methods and Weigert's glia and elastica stains. In a greater or less degree, these changes were demonstrated by practically all other histological procedures employed in the study of this case. The typical parietic histopathology, however, was frequently overshadowed by rather numerous and extensive homogeneous deposits. The peculiar deposits were likewise exhibited by all of the technical methods, with some methods showing a great affinity for certain dyes, even with those where they failed to take the stain their optical character made them easily the most striking feature of the microscopical field. The deposits were confined almost wholly to the cere-

bral cortex; only in areas where the involvement was the greatest were a few of them encountered in the outer portion of the white substance. Numerous sections made from the basal ganglia, mid-brain, pons, medulla and spinal cord were negative. All cortical laminæ were indiscriminately affected (Fig. 1), and while generally the outer half of the gray matter contained a richer deposit, sometimes the inner half displayed the greater involvement. The mesoblastic apparatus seems to be the seat of the process, particularly the smaller vessels. In a given vessel, the deposit sometimes extended throughout all of the tunics, producing an enormous thickening of the wall and in many instances occlusion of the lumen. In those specimens where the deposits failed to take the stain, as for example Nissl sections, the affected vessel walls were of a glassy or waxy appearance, the smaller vessels looking not unlike urinary casts. Fig. 16, from Case II, serves equally well to portray the alterations in many of the smaller vessels of this case. This conversion of the vessel wall into a homogeneous substance does not take place simultaneously in all of the tunics, for frequently along with massive deposits one finds small discrete globules or groups of globules on the verge of coalescence. (Fig. 2.) Many vessels were observed in which the process was confined to a single tunic, but in such instances it was always the adventitia or media, examples of which are illustrated in Figs. 3 and 4. In Fig. 3, a vessel found just beneath the gray matter at the bottom of a sulcus, the media is shown thickened and converted into a homogeneous mass, while the adventitia and endothelium remain relatively, if not absolutely, intact. In Fig. 4, a capillary of the molecular layer, it is the adventitia that bears the brunt of the burden. Though this vascular coat is tremendously thickened for so small a vessel, the endothelial cells are still visible and the lumen patent. Vessels so affected may go on to obliteration of the lumen and still show endothelial cells grouped about the center or nearer the periphery of the mass, depending upon whether or not the process in the vessel wall has been concentric or eccentric in its development. Finally, even endothelial cells disappear and the result as seen in section is a circular or irregular mass which may give the impression of a deposit laid down outside of the vessel wall. In Fig. 5, capillaries involved by fairly large deposits but showing their endothelium preserved, a small vessel in which the process developed eccentrically, a small occluded vessel and a comparatively large vessel presenting the typical perivascular infiltration of general paresis at the top and left of which a large homogeneous mass seems to be flowing around some of the infiltrated cells, are all shown as part of the findings in a single field of an 8 mm. objective.

Always surrounding affected vessels, of whatever stage in the development of the process, a clear space can be made out, a space in excess of that shown around the unaffected vessels. This apparently is not the result solely of shrinkage produced by the various fixatives, but is the dilated perivascular space, brought about, in all probability, by an embarrassment of the lymph flow.

Nowhere, in early or in advanced stages of the process, are homogeneous deposits encountered free in the dilated spaces just mentioned. That the alterations in vessel walls, with their consequent thickening and encroachment on the perivascular lymph channels, offer serious embarrassment to the lymph circulation, the appearance of tissues surrounding blood vessels of the white substance would seem to indicate, particularly in those portions of the marrow where the overlying cortex exhibited the most extensive deposits. Figs. 6 and 7 are typical of many vessels found in the white substance. In Fig. 6, peripheral to the readily visible though dilated and somewhat distorted ordinary perivascular space, is a considerably larger but wide-meshed area, its trabeculae rather coarse fibered, not unlike the disturbances which an edema produces, save for the rather coarse fibers which traverse the lighter zone. In the perivascular space proper there is no cellular infiltration; in the meshed zone the cells shown are amœboid glia cells, large cells containing lipoid granules (probably of mesodermic origin), a few plasma cells and lymphocytes. Fig. 7 exhibits the typical perivascular infiltration of general paresis, peripheral to which is also shown an edema-like area, such as was described for the preceding figure, though containing fewer cells. When vessels so affected are stained by the tannin-silver method of Achucarro,²⁰ sometimes the coarse-fibered mesh described above, is shown to be directly continuous with a coarse net-like proliferation of fibers in the vessel wall. Occasionally in the cortex, perhaps more frequently here than in the white substance, vessels were encountered which exhibited a coarse net-like proliferation of mesodermal fibers with an extension of the net into the surrounding structures, though never in so pronounced a manner as shown in Achucarro's published photographs. (This may in part be due to the fact that our material was not examined by the tannin-silver method until it had been conserved in formalin for about fourteen months. Nevertheless, where shown, this net-like proliferation, or syncytium of connective tissue fibers, extending into surrounding structures and in instances passing over and becoming continuous with similar adventitial proliferations in neighboring vessels, was a convincing demonstration of the type of vascular change to which Snesarew^{21, 22} and Achucarro²⁰ have called attention. Figs. 8 and 9. Similar proliferations are also shown by the Bielschowsky method, though of course there is no real differentiation except that offered by the general appearance of the structures. Fig. 10.) In the opinion of the writer, the meshed zonal area surrounding the vessels of the white substance is not an artefact, for it has been found after all of the fixatives employed and in sections made after and without imbedding.

A careful study of those deposits described in the literature as *extravascular*—and indeed as such they appear from a casual inspection of Figs. 2, 5, 11 and 12—leads to the conviction that in the majority of instances they are none other than greatly altered vessels, the larger masses representing enormously thickened vascular walls which have obliterated the lumina, or contiguous vessels which have coalesced. The smaller masses are con-

ceived as fine calibered vessels whose lumina are obliterated, isolated globules or group of globules in the walls of otherwise invisible vessels and, perhaps, isolated globules in the meshes of the net-like proliferation of the adventitia which certain tannin-silver preparations strongly suggest and also indicated in Bielschowsky sections. Fig. 13. So if this latter be true (deposits in the net-like proliferation of the adventitia) then it is seen that the peculiar process involves only mesoblastic structures.

In Fig. 11, a vessel is shown cut longitudinally and on either side of it rather large, irregular shaped, homogeneous masses. Such pictures suggest the *relative-aggregative* type of vessel proliferation described by Cerletti.²³ The deposits shown in Fig. 11, the writer believes, represent smaller vessels given off from the larger unaffected arterial twig which having undergone this homogenous change and in consequence of the shrinkage resulting from destruction of intervascular nervous elements have been brought closer together. This interpretation is not invalidated by the absence of deposits in the larger vessel which is looked upon as the main branch of this particular system, for as pointed out above—and a glance at almost any of the illustrations would show—the smallest vessels are the favored seat of these changes. Again, in Fig. 12, an aggregative type of vessel proliferation is conceivable, but here one thinks of Cerletti's *absolute-aggregative* type. (Figs. 11 and 12 were photographed under exactly the same magnification; Fig. 11, frozen section of material fixed in Weigert's glia mordant, without previous formalin, and colored with Van Gieson's stain, while Fig. 12 is from a frozen section after formalin fixation, the section treated with alcohol for a few minutes and afterwards stained with Weigert's elastica stain. This latter method and the Bielschowsky silver impregnation process usually displayed the greatest number of deposits). The type of deposits which on casual inspection appears extravascular is far more numerous than the instances which offer no question as to vessel involvement.

In well-differentiated Nissl specimens the deposits are shown as glistening homogeneous masses and in those specimens sectioned without imbedding there are relatively large, clear spaces, the result of a dropping out of the homogeneous masses in the process of handling. With hæmatoxylin, such as employed in Alzheimer's method IV, or other hæmatoxylin solutions, the deposits are also glassy in appearance, while the Van Gieson method stains them in varying nuances of a dark, dull red—a brick red—never the brilliant red which connective tissue fibers of mesodermal origin take on with this stain, and makes them sufficiently distinctive so as not in anyway to be confused with glial structures. Even where the process is not sharply delimited in the wall of a given vessel, this difference in color permits a clear differentiation of the affected from the non-affected parts. (It might be noted here that material fixed in Weigert's glia mordant, sectioned without imbedding—frozen sections—and stained after the Van Gieson method yields very brilliant results, offering an excellent differentiation of the various cellular and fibrillary elements which are superior to

the results obtained by the usual application of this method.) Carmine solutions stain the deposits a dull light red and Rosin's method a flesh-pink, but none of these yield quite as many deposits as Weigert's elastica stain (applied as noted above) or the Bielschowsky silver aldehyde method, the former staining them a grayish purple to a deep royal purple, the latter in varying sepia tones to an almost pure black. The Levaditi silver impregnation method imparts a brownish yellow color to the homogeneous deposits, while Achucarro's tannin-silver produces a reddish brown color, brownish black, or black. Iodine green stains by far the great majority of the deposits a light green like most of the surrounding structures. One sees here and there, however, a mass stained a dark green and some of these latter exhibit the faintest suspicion of an amethyst or purple color tone. With methyl violet on frozen sections from formalin material the deposits, as a rule, strike a light red or pink color; some, however, are purple like the surrounding structures, while iodine solutions stain them yellow mostly, like the surrounding elements, but some of the masses are stained brown, though never a very deep brown. With sections treated from five to ten minutes with slightly acid aqueous solutions before applying the iodine, one more frequently obtained brown staining. Strong sulphuric acid being added, intensified the staining, but scarcely to the point of the classical "dark mahogany color."

Frozen sections of formalin material boiled in water, or in a strongly alkaline aqueous solution (40% NaOH), were not affected in the least, so far as concerns the deposits, for after boiling and washing rapidly in water, they showed on staining with the picric-acid fuchsin mixture a great profusion of the homogeneous masses, even to the very smallest deposits. Long continued action of a concentrated acid (H_2SO_4) did not produce a solution of the deposits, but rendered them more difficult to stain with acid fuchsin solutions and intensified the browning which some of the deposits exhibited when iodine solutions were applied.

The absence of any marked cellular or fibrillary gliosis about the deposits was particularly noticeable. To be sure, large glia cells and coarse-fibered proliferation were shown (Weigert's glia stain) about many of the vessels affected by the process, but these were not inconsistent with the glial changes of general paresis. Sometimes, where smaller deposits were grouped, coarse glia fibers could be seen threading their way through the colony and near by one or several large glia cells, but such instances were rare. Among such groups of the smaller masses, when the tannin-silver method was employed, one found occasionally a rather net-like arrangement of dark fibers (connective tissue fibers) within the meshes of which some of the deposits lay. These black fibers were well differentiated from another type of fiber sometimes seen within the groups, the brownish fibers of glial origin. In Bielschowsky sections showing fibrous adventitial nets the deposits were displayed within the meshes of the net. Fig. 13.

No ganglion cell or nerve fiber was shown which exhibited homogeneous alterations suggestive of the alterations in vessel walls. The ganglion cell

changes observed in general paresis, of which there is an abundant literature, were practically all shown and need not be detailed here.

Finally, blocks from the frontal, central, superior parietal and calcarine areas and from the basal ganglia and spinal cord prepared after the Levaditi method proved negative for *treponema pallidum*.

Epicrisis.—The clinical record and anatomical findings leave little doubt as to general paresis in this case. The numerous homogeneous deposits within the mesoblastic apparatus were the most interesting of the structural changes and have given the impetus for the report of the case. The process is not a common one, though Liebmann²² in an early communication maintained that it was a frequent accompaniment of general paresis, a contention not corroborated by those who have had a large experience with autopsies on this class of subjects. Indeed, since the publication of the two cases of Alzheimer in 1896, the two cases reported in 1911 and 1912, one by Mignot and Marchand and the other by Sioli, are the only instances known to the writer where the process has been recorded as present to any great degree. The alterations, then, are sufficiently rare to give a special interest to those cases in which they occur. The various interpretations which have been set forth, in the light of our increased knowledge of brain histopathology, may be now subjected to more critical analysis and, perhaps, a clearer conception of the whole process may be gained.

As to these deposits, the question uppermost is what relation do they bear to the general parietic process, or, if you will, to the underlying syphilitic infection? More and more we are recognizing a variability in the anatomical expression of lues equalling almost its numerous clinical manifestations, facts which merit scarcely more than a mere mention. In view of Noguchi's and Moore's²³ recent discovery, we must class general paresis not as the perfect paradigm of a metaluetic process, but rather as one of the manifestations of an active syphilitic process which not only as the *treponema* indicates, but, as pointed out by these observers, is also indicated in the commonly present Wassermann reaction. Amyloid degeneration of trunk organs as associated with the infectious granulomata is not an extraordinarily rare finding at autopsy, though more common in the material from a general hospital than among the autopsies on the insane. That similar deposits did not occur in the trunk organs is interesting, but points,

perhaps, to the fact that the infection played itself out largely in the central nervous system. In a way, then, the deposits described above may be looked upon as one of the many structural changes which accompany or result from a syphilitic infection, to be sure while not as common as some other changes may occur as frequently, let us say, as some of the rarer endothelial alterations of small cortical vessels described by Nissl.³⁵ The characteristic microchemical reaction of amyloid, however, was certainly lacking in by far the great majority of the deposits, and yet the manner in which some of them responded to iodine solutions and iodine green was at least suggestive of a transitional stage of amyloid. Moreover, the richer deposits which some methods showed over others, with material from areas not over a few millimeters apart and sometimes from the same block, together with certain differential staining of the deposits in almost any given section would indicate a difference in their finer chemical composition. Bearing in mind what was mentioned above, as to amyloid substances being albuminous unions of high molecular valence, one may interpret the deposits in this case as a sort of pre-stage of amyloid.*

The more detailed study of the homogeneous masses in this case does not lead one to look upon them as degenerations in the common acceptance of the term as applied to fixed cells or even to proliferated cells originating in the vicinity or coming from a distance, in so far as cells of epiblastic origin are concerned. In the hundreds of sections examined, not a single cell or fiber of the glia or nervous apparatus exhibited the slightest suggestion of a deposit comparable to the alterations shown in vessel walls. The origin of the deposits, therefore, must be sought in the mesoblastic apparatus and its circulating fluids. To consider these homogeneous masses as resulting from albuminous precipitates from the blood plasma or lymph is not wholly speculative; it is at least worthy of consideration. Always, as shown by the illustrations, it is mesodermal fibers that undergo this homogeneous conversion and the more or less round, small, light areas sometimes seen in the deposits (for example Fig. 6) may be residuals of mesoblastic cells

* Concerning the vast literature of the origin of amyloid no review can be undertaken here. The reader is referred to the recent paper by Stürmer³⁶ on corpora amylacea and to Weigert's³⁷ critique on coagulation necrosis and its relation to hyaline formation.

in the perivascular infiltration and proliferated cells of the vessel walls. As an interpretation of the zonal disturbance about the vessels of the white substance as illustrated in Figs. 6, 7, and 9, the writer conceives nothing more satisfactory than to look upon it as the result of a lymph transudation seeking a point of least resistance, or perhaps a simple dilatation of the perivascular space, its natural course being impeded by the enormous deposits in the vessels of the overlying cortex.

A feature which the study of this case brings out is the existence of many more blood vessels of smaller caliber than were supposed to be present in the brain, assuming of course that the submitted interpretation of the so-called extravascular deposits (*vide* Microscopical Examination) is correct. Cerletti,²² in his recent monograph on vessel proliferation, has called attention in rather convincing manner to what we have been in the habit of considering as vascular proliferations in certain chronic wasting diseases of the brain as no actual increase in vessels but only vessels which have always existed, now occupying a smaller area as the result of the destruction of intervascular elements. Even in certain acute processes he has shown that many vessels are brought to light by alterations in their walls which otherwise would have escaped notice by present technical procedures. The findings in this case, the writer believes, substantiate the views of Cerletti as to relative vessel proliferation. If those at first sight, seemingly-extravascular deposits, are not residuals of vessels, or deposits within the proliferated net-like extensions of the adventitia, then their presence is difficult to explain. As to deposits within the proliferated extensions of the adventitia, Fig. 13 seems to give conclusive evidence.

CASE II.

Summary.—A woman of 26, with history of hysterical behavior and unconventional social conduct, when 24 and during a period of stress as result of family misfortune and financial stringency, had a convulsive seizure—right hemiplegia supervening, but lasting only a few hours. Six months later, sudden loss of consciousness with convulsions and frothing at the mouth, for several days thereafter much confused mentally. Then followed a period of considerable sexual hyperæsthesia and after about four months

apparent apoplectic insult with right hemiplegia and motor (!) aphasia for four days. Marked mental dilapidation ensued. Three months later another apparent apoplectic insult, also followed by loss of motor power in right lower extremity with partial restoration later, but general physical weakness and mental deterioration progressed; she was depressed and hallucinated. In hospital, more or less permanent aphasic disorder, for the greater part of the time untidy and mentally confused. Sudden development of motor weakness in right leg and right arm with wrist drop and pseudo-athetoid movements of right hand, lasting over a month, and then almost as suddenly restitution of power and normal manipulations of hand. Cutaneous pain sense persistently diminished; Noguchi blood serum test positive. Finally, a wild delirium; lobar pneumonia; death. At autopsy, gross lesions of general paresis, no coarse focal lesions of brain. Microscopically, typical histopathology of general paresis, lesions indistinguishable from active cerebral lues and focalized amyloid changes of vessels in right calcarine area.

W. S. H., No. 10058, a woman of 26, was admitted March 30, 1911, with a history of mental disorder of five months duration, though it is likely, judging from the anamnesis, the disturbance had existed for a longer period. This was her first admission to a hospital of this character.

Family History (as given by husband).—Father and mother are living and in good health, the former 70, the latter 55 years of age. Three sisters and two brothers are living and well. A third brother is a heavy drinker. A fourth brother was formerly at the Waverly School for Feeble-minded (Mass.). He is said to have had an accident when a small child, following which he developed epileptic convulsions. He has since died. One of the sisters is a wayward girl, having given birth to an illegitimate child when fourteen.

Previous History.—(There were two sources of information regarding the past history of patient—each more or less hostile to the other—a sister and the husband. The sister claimed that the husband was only a common law husband, and that his ill-treatment was mainly responsible for patient's present condition, while the husband maintained that family interference and constant nagging of relatives had brought about her predicament. So that many statements from each of these sources had to be taken *cum grano salis*.)

As given by sister: Up to patient's fifteenth year nothing out of the ordinary run of a young girl's life is reported. When she was fifteen, she ran away with a youth of about her own age and was married to him, but the union was not a happy one and two years later she secured a divorce

on the ground of non-support. She then went to live in Boston, having previously lived in a small New England town, supporting herself as a waitress. This she did for two years, when in the course of her duties she met the present husband, with whom she has lived ever since, but was never formally married to him. It is claimed that the man failed to support her properly; that she was obliged frequently to do outside work, working in a laundry and at other forms of hard labor to obtain the necessities of life. Of hardships with her husband she said nothing to her family until the summer of 1911, when she was on a visit to her people. At that time, the sister states, she appeared much run-down physically and mentally, she was discouraged and very unhappy. She refused, however, to leave her husband and make her home with her parents as they had requested. During the visit home, while out in the garden one day, she had some sort of seizure, she fell unconscious to the ground and was convulsed. The sister did not remember whether or not the convulsions were of a general nature, but said that patient frothed at the mouth and that for two days following she was very much confused. Shortly afterwards she returned to her home in Cambridge and is said to have had a violent quarrel with her husband and his relatives, but she did not leave him. In January, 1912, she was still weak and in consequence could not aid in support of the household as formerly, but she received little sympathy from her husband. It is said the husband was jealous and abusive of her. Soon after the episode in January she made several attempts to leave her husband, in fact actually left his roof, but each time returned voluntarily.

As given by the husband, the previous history reads something as follows: Since husband has known patient she has always been "excitable, strong tempered and very impatient," especially "when not allowed her own way," easily becoming "hysterical," yet withal readily calmed when reasoned with. Save for a rather obstinate constipation, her health, on the whole, had been good. For about a year, 1907-1908, she increased rapidly in weight, weighing 180 lbs., whereas her normal weight was about 130 lbs., but was not as well as formerly. This was due, the husband believed, to an inactive mode of living and to constipation which was most severe during that period. After 1908 she was much more active, lived in Panama for six months, rode horseback considerably and adopted a diet containing much raw fruit, with resulting loss in weight and general improvement in health. For two years she was in good health. During the latter part of 1910 she was impelled from family considerations to take into her home a younger sister, who at the age of fourteen was about to give birth to an illegitimate child. The sister's misfortune was a source of much worry to her and this, coupled with her husband's financial affairs, which made it difficult for them to pay their bills with regularity, seemed to completely overwhelm her. At this time (December 10, 1910,) she is said to have had "a very slight attack of paralysis, which lasted only a few hours." In October, 1911, one day while the husband was away from home, she had some sort of fit, called, it is said, by the attending physician "an attack of

epilepsy," and that this was followed by a paralysis of the right half of the body and a marked impairment of speech. (From the rather poor description given, the speech defect was probably a motor disorder.) The paralysis and the speech disturbance lasted in full force for three or four days and then gradually improved, but the improvement in speech lagged behind the restoration of motor power. Even after the improvement in speech and paralysis she was more or less forgetful and generally indifferent. On the date of the last-mentioned attack she had been sorely disappointed in having to forego attendance at the Brockton Fair. In January, 1912, she had another fit, also followed by right hemiplegia, which lasted about three days. This attack supervened a long automobile ride which had been not only fatiguing, but also depressing, in that while at her mother's home to which they had driven she had been much commiserated, the mother and a sister expressing their fears to her that she (patient) was "going into decline." For several weeks prior to this last attack she had exhibited considerable sexual hyperæsthesia but now this abated; her memory was worse and she failed progressively. At this time, because of her husband's business (insurance agent) and without a maid and other companionship, she had to be left alone most of the daytime. She then began to seek companionship by visiting the neighbors in the apartment house where she lived to whom she was not welcome and on such visits managed to get into several quarrels. All of this contributed to make her condition worse. Finally, for several weeks at a time she would not leave her bed, refused to have the bed linen changed, would not eat, claimed she could hear her mother who lived at a distance talking to her; lost in weight, became depressed and said she would not live.

Here.—On admission a young woman of slender build, though well proportioned and relatively well nourished, presented the appearance of considerable personal neglect. As she met the receiving physician she seemed perplexed and apprehensive and was rather resistive. She refused to walk to the ward and had to be wheeled. The character of the gait on entrance, therefore, could not be determined, but a later observation did not show any special alteration, save perhaps an extreme care in taking each step, a certain lack of surefootedness.

The heart's action was of good force and normal tempo, no murmurs, blood pressure 119 mm. Hg. Nares obstructed; high arched palate; respirations vesicular; no râles; no dullness. The tongue was heavily coated, the buccal cavity dry; examination of abdominal viscera revealed no pathological conditions. The breasts were pendulous; the skin in fair condition, save for numerous small abrasions on face, the result of constant picking, numerous small, dark moles on torso and vaccination scars on arms; dermatographia.

The pupils were widely dilated and reacted sluggishly to light and accommodation; hearing in right ear apparently normal, in left ear greatly impaired. Tests for taste and smell integrity or impairment gave doubtful results. She did not react to rather deep pin pricks of the skin, even over

the nipple areas. The soles of the feet, however, were very sensitive to stroking. She did not co-operate in tests for the discrimination of cold and warm stimuli; swaying in Romberg. All tendon reflexes elicited; no Babinski; no Oppenheim; tremor and jerkiness of tongue; coarse tremor of outstretched fingers; co-ordination movements poorly executed.

She smiled almost constantly and this, with the widely dilated pupils, gave a rather animated facial expression. She smacked her lips frequently as though there were something in her mouth which she relished. To most questions she replied, "I don't know," or, "Not acquainted," and these expressions she uttered rather indistinctly. Other replies were frequently wholly unintelligible. She understood simple requests and usually complied with them, such as, put out your tongue, hold out your hands, spread the fingers, etc. She gave correctly her own name, the name of her husband and her home address. To all other questions as to orientation and for determination of the possible existence of hallucinations or delusions, she replied as noted above, "I don't know," "not acquainted." She permitted her tongue to be repeatedly pricked with a pin without showing the slightest objection or the least discomfort. She exhibited a sense of modesty in that she took great pains not to expose any part of her person save when requested to do so for an examination. In general she appeared to comprehend what was said to her, despite the character of her replies. Spontaneous speech utterances were few and reactive sentences were usually short and generally paraphasic or altogether unintelligible.

April 2, 1912. Last night, the third after admission, patient was much disturbed; she was not only noisy, but walked about the ward aimlessly and tried to get into the beds of other patients. A warm pack was given with beneficial results.

April 8, 1912. During the last three days patient has been very quiet; she has been untidy much of the time. She lies in bed with eyelids partially closed, apparently taking no notice of her surroundings. She makes no effort to assist herself. Once since admission she has shown a tendency to resistiveness.

May 7, 1912. During the last month patient's appetite has been poor; she had to be tube-fed sixty-three times in April and four times since the beginning of May. She has lost in weight. She lies in bed with her head beneath the bed clothing. When spoken to she usually smiles in a rather silly manner and either says nothing or mumbles unintelligibly. Moreover, she takes no interest in her surrounding and does not co-operate with examiner, so that orientation, delusions or hallucinations cannot be determined. She does not appear hallucinated.

July 18, 1912. To-day patient began to have convulsive movements of the right extremities, but when sharply spoken to by the nurse the movements ceased suddenly.

July 22, 1912. Constant twitching of muscles of right shoulder and arm, especially of the trapezius. The shoulder is jerked upward and the head downward and to the right. She is conscious, but her replies to questions

are no better than previously noted. The pupils are widely dilated and very sluggish to light. The nurse reports that the twitchings began in the muscles of the lower arm and hand, and that for about half an hour the thumb and index finger moved rapidly. No Babinski; no Oppenheim.

July 24, 1912. The muscular contractions recorded in the last note, particularly those of the right trapezius, continued actively until to-day; now they are barely perceptible.

August 27, 1912. Early in present month she began to reply to questions rather more frequently and in a more orderly manner than formerly, but she was still untidy with bladder and bowel movements. She also ate better for a while, but since the 22d of the month has been tube-fed. To-day in reply to the physician's greeting she said she was "feeling well" and volunteered the remark that her husband was here lately (fact) and added that she preferred to remain at the institution rather than return to her home. After this she would answer no further questions or make any voluntary remark; only smiled in a silly manner.

October 31, 1912. Since September 13th, when she began to eat of her own accord, she has seemed brighter mentally, but her speech content is often paraphasic. To-day the pupils are widely dilated and stiff to light, and there is considerable jerkiness and tremor of the tongue on protrusion. There is also considerable motor weakness of the right arm and hand. The right hand is reflexed at the wrist, while the fingers are extended. With this hand she makes apparently involuntary movements which are athetoid in character. When she attempts to walk the gait is rather tottery and somewhat ataxic (!).

Co-operation in the aphasic examination undertaken was poor, with consequently unsatisfactory results. She appeared, however, to comprehend simple language and complied with simple requests. She made no attempt to carry out more complex tests. Her greatest difficulty seemed an inability to find the proper word or words with which to form her replies.

Q. What is your name?

A. W——. (Correct.)

Q. What is your name?

A. Esther W——. (Patient's first name is Jeannette.)

Q. How old are you?

A. I am (then after a long pause and rather hesitatingly) about 30. Is that good? I guess it's old enough.

Q. How long have you been sick?

A. Not very long.

Q. How long have you been sick?

A. (No answer.)

Etc. No answer to questions to determine orientation of parts of body. Asked to count from 1-100, she got as far as 39, but with great difficulty, giving hesitatingly each number and remarking frequently, "I know just as

well." From 40-50 she had to be prompted several times. She could go no farther. When shown a watch, coin, pencil, keys, scissors, etc., and asked to name them, she invariably replied, "I ought to know." Asked to tell the time of day by the watch, she repeated the question. Asked to repeat the words of the hymn America said, "My Country, ties of thee—Sweet lavender," and then made no further attempt.

November 4, 1912. Cutaneous pain sense again tested. She does not react to pin pricks anywhere, even where deep enough to draw blood. The pupils are dilated and still; she failed to co-operate in tests for accommodation. The knee-jerks are exaggerated, right more than left. The condition of the right hand remains as described above. Attempts to straighten the hand seem to cause the patient pain, for she winces and draws it away. The tongue comes out straight, but is tremulous and jerky. She named correctly a bunch of keys and a pencil, but failed to name a watch and several other common objects. Where do you live? W——. (Patient's name.) What is your name? A lowly uttered, unintelligible reply. To all other questions she was silent, only smiled at the questioner. Her facial expression denotes a fair degree of elation. The nurse reports that at times she talks of past events in her life, of her early life and of happenings on the ward during her stay here; that some days she talks better, that is, practically without paraphasia, and also that she frequently gives the impression of wanting to say something but cannot find the proper words to express herself.

November 11, 1912. To-day she straightened her right hand voluntarily the first time since the peculiar wrist drop and pseudoathetoid movements developed and manipulated the hand in a normal manner, though rather falteringly. Since the last note it has been observed that the pupils vary greatly from time to time in their diameter, but all light reaction fail.

January 2, 1913. Following the last note patient began to show some mental improvement: she displayed more interest in her surroundings; became more tidy; even asked to be taken to the toilet and generally complied with requests. The quality of spoken language improved and while she could only occasionally name correctly a series of objects placed before her, spontaneous speech utterances were better. The pseudoathetoid movements of the right hand disappeared and she made some effort to use the hand which she had previously favored. She could grasp rather large objects, take up a piece of bread and feed herself with this hand when anyone stood by; otherwise she fed herself with the left hand.

A week ago she suddenly became wildly excited and acted as though hallucinated. She screamed aloud, threw herself from the bed and attempted to run about the ward, but the weakness of the lower extremities, particularly the right, caused her to fall frequently. She appeared terrified yesterday while in the neutral bath and fainted. After removal an examination of the lungs revealed some moist râles, but no areas of consolidation.

January 3, 1913. A Noguchi test of the blood serum gave a positive re-

action. Patient continues wildly excited, especially when anyone enters her room.

January 8, 1913. Two days ago a temperature of 102 F. (rectal) developed. Examination revealed a consolidation of the right lung. Since the onset of the temperature she has been less excited. The mouth is dry and sordes collect rapidly on the teeth and tongue. Three days ago she repeatedly frequently the word "ray," the only intelligible word uttered since the excitement, and whenever the examiner said the word she smiled. Yesterday she said "dry" and pointed to her mouth. When water was given she seemed very grateful. These two words are the only intelligible utterances since the onset of excitement. She has emaciated. The pulse is weak and rapid and there is difficulty in swallowing.

January 11, 1913. Patient continued to fail and died at 11.50 p. m.

Anatomical Diagnosis.—General paresis. Increased thickness and density of calvarium, dural congestion, pial congestion and opacity with pronounced increase Pacchionian granulations, atrophy of cerebral gyri, granular ependymitis, few atheromatous patches of the larger vessels at the base of cerebrum, no coarse focal lesions save area in right calcarine cortex extending for a distance of approximately 2.5 cm. and involving area of the line of Genarri which is grayish in color, glistening, firmer and more elevated than surrounding structures of the cut surface (amyloid degen, gumma!), congestion and pial opacity of spinal cord; moderate chronic aortitis of ascending aorta; lobar pneumonia; hepatic congestion; splenic congestion; gastritis; pyelo-nephritis, cystitis, uterine congestion, cystic ovaries.

Abstract of Autopsy Protocol.—The calvarium is of variable thickness, measuring through perpendicular portion of frontal bone 1.2 cm., through portions of the parietals and occipital 1 cm., its diploe scant. The dura is normally adherent, congested and bulges laterally. The visceral surface of this membrane is smooth. The pia is congested, edematous and opaque. The opacity is limited largely to the cerebral convexity (frontal and parietal areas), the mesial surfaces of the frontal lobes and the superior surface of the cerebellum. Pacchionian granulations are greatly increased, appearing along middle two-fourths of the longitudinal sinus on each side in one continuous line and extending downward on the convexity at some points for distances of fully 1.5 cm. Over the foot of F_1 and also F_2 (right side) are several small more or less circular areas (3-5 mm.) in diameter, where the pia is considerably thickened, rough and firm. These areas look not unlike Pacchionian granulations. More orally similar areas are found, some of which overlay and extend into the sulci. The cerebral gyri exhibit considerable atrophy which, though diffused throughout the cerebrum, is most pronounced in the frontal regions and generally throughout the left hemisphere. There is accordingly a moderate degree of cerebral asymmetry, the right hemisphere being the larger. On the left occipital convexity, a semilunar sulcus (*Affenspalte*) presents and on the right side there is a similar sulcus, but this is interrupted inferiorly by an annectant gyrus.

Otherwise there is no material variation from the usual cerebral configuration. Save for a few small atheromatous patches in the basal artery and middle cerebrals, the blood vessels offer no gross changes. The pons, medulla and cerebellum share in the general atrophic changes. The floor of the fourth ventricle presents a granular appearance, as though sprinkled with sand, and on section of the cerebral hemispheres the ependyma of the lateral ventricles present a similar condition though less marked. The gray matter, rather generally, is thinner than normal and the cut surface is everywhere congested. Coarse focal lesions fail, save in the calcarine cortex of the right hemisphere, where a distinctly noticeable grayish, firm linear area involving the line of Gennari and immediately contiguous portions seen in sections of the upper lip of the fissure in a space not exceeding much more than 2.5 cm. . . .

The brain with pia attached and before section weighs 1040 gm. After section, the right hemispheres weigh 480 gm.; the left 450 gm.; pons, medulla and cerebellum 180 gm. The skull capacity after the method of Rosanoff and Wiseman is 1200 cc. Representative levels of the spinal cord on section reveal no gross tract alterations. . . .

The subject had emaciated greatly and a lobar pneumonia in the gray stage of hepatization, a cystitis and pyelo-nephritis were found, but these need not be detailed. The only other gross finding to which attention would be called was the position of the right hand. This was much as described in the clinical history (*vide supra*), save that while the proximal and middle phalanges were extended, as above, the distal phalanges were slightly flexed, so that the hand had something of the appearance of the so-called "claw hand."

The trunk organs offered no gross or microscopical evidence of amyloid degeneration.

Microscopic Examination.—The microscopical report is limited to the central nervous system, for much the same reason as was given in the report of Case I.

Here, the classical histopathology of general paresis predominated. Nevertheless, certain areas in the occipital cortex—where to be sure parietic lesions are commonly less severe—in the lenticular nuclei and even in the central gyri were less typical of paresis. One encountered a perivascular infiltration, largely or exclusively lymphocytic, and certain endothelial proliferations, usually in small vessels without infiltrative phenomena, which made one think of a "lues-general paresis combination," or a transition of more acute luetic changes into the more chronically coursing parietic histopathology. Attention was arrested immediately by vessels so affected, for the infiltration exceeded by far the most pronounced infiltration of the plasma cell type, and these latter were by no means insignificant while those vessels which exhibited a proliferation of succulent-looking endothelial cells were equally striking. The infiltrative type of lesion was found alike in gray and white substances, while the endothelial proliferative type was exhibited only in the cortex. The pial infiltration, however,

was always sharply delimited from the underlying cortex, even in the small focalized areas of great thickening and opacity noted on the convexity of the frontal lobes.

While none of the areas studied were wholly free from one or more of the typical histopathological features of general paresis, sections from some areas if taken alone would not warrant an anatomical diagnosis of paresis. Yet the case cannot be considered as an example of Lissauer's paralysis, even though certain clinical symptoms previously detailed might suggest such a possibility. In Fig. 14, a twenty μ section from the right calcarine cortex—alcohol fixation, celloidin imbedding, Van Gieson stain—if one disregards for the moment the rather prominent focalized area or apparent vessel proliferation with marked alterations in the vascular tunics, there is little suggestive of paresis. There is certainly no very appreciable stratigraphic disturbance, so common in paresis; no perivascular infiltration visible at this magnification; no "packets" or other evidence of increased vessel proliferation, either side of the previous excluded zone. Yet, in this section, infiltration of small vessels with a few plasma cells, and rod cells can be found with the oil immersion objective. Compare with Fig. 15, a fifteen μ section T₁, left, technical details as in Fig. 14, save for staining with toluidin blue after Nissl, and one has less hesitancy in pronouncing general paresis.

Little, if anything, would be gained by a more detailed description of the paretic changes shown in this case, but before going on with the consideration of more special changes a word should be added of the spinal cord. In the spinal cord there were no system lesions sufficiently pronounced as to be demonstrable as such in myelin sheath preparations, but with the Alzheimer IV and V methods, particularly V, a somewhat richer fiber net work and an increased number of fiber-forming glia cells were shown in the posterior columns and pyramidal tracts. With all methods employed a great number of corpora amylacea were encountered, most numerous in the posterior columns. They exceeded by far the number of such structures so commonly shown in spinal cord sections from elderly subjects.

For the writer, the most interesting of the microscopical findings were the alterations in the walls of vessels found in the short stretch of the calcarine cortex noted in the autopsy protocol, alterations stratigraphically focalized in the area corresponding to Brodmann's *IVc*, *V*, *VIa* and *VIb* laminae. Fig. 14 gives a good representation of the focal character of the process and of the wealth of vessels displayed in the affected area. Whatever the nature of the process may be there is little doubt of its intimate relation to the vascular apparatus and that it is restricted chiefly, if not wholly, thereto. So-called extravascular deposits are not evident at this magnification, as for example in Fig. 1 from Case I. In the section of which Fig. 14 is a photograph (Van Gieson stain, alcohol fixation) the most of these altered vessels are stained a dark dull red, the remainder varying nuances of red, but in well differentiated toluidin specimens, as in Fig. 16 (celloidin removed before staining), they are colorless and highly refractile. (In

poorly differentiated toluidin sections they are stained in all shades from a very deep blue to an azure and if the celloidin is not removed they are always a very dark blue.) Many of the affected vessels seem entirely occluded by the process and in such all tunics seemed to have suffered equally. The deposits are laid down as discrete globules which may be seen in varying sizes in vessels where the process is less advanced. These globules tend to coalesce, but even in the vessels most affected and where there is apparent occlusion, evidence of their independent origin is still shown. (Figs. 17 and 18.) Sometimes a vessel is shown in the wall of which none but very fine globules are displayed, but these fine globules are readily detected and differentiated from other structures by their highly refractile property in toluidin specimens and in sections of the Alzheimer IV method, their great affinity for the fuchsin of the Van Gieson stain, and the blue color with the Alzheimer V. Sections from material fixed in Weigert's glia mordant, cut on the freezing microtome, or after rapid dehydration, paraffin imbedding and then stained after Van Gieson proved most instructive. Fig. 17 is the photograph of a section prepared as last mentioned. To the right a vessel is shown longitudinally in which all sizes of the globules are displayed, while at the left and superiorly are occluded vessels with coarser deposits. By this method, too, affected vessels are shown in the disturbed area which are stained yellow, though such staining is not as common as the dark red and lighter red. With iodine green few vessels show a distinct amethyst color and with iodine solutions an equal number are stained a rich brown. Cellular and fibrillary glia reactions, as Figs. 16 and 17 show, are not especially marked in the vicinity of the affected vessels, though one occasionally sees in a section as pictured in Fig. 18 a large glia cell attempting to inclose a globular deposit which, however, is so near, or a part of a vessel that it is not clear whether or not the presence of this cell has relation to the vessel as a diseased vessel, or is a special reaction to the deposit. With the Levaditi silver impregnation method for *treponema pallidum*, while some of the altered vessels take the silver in varying shades of brown, the greater number preserve their natural color, a glistening waxy appearance. The search for *treponema*, as in Case I, proved negative. Here, however, there was considerable fibrillary glia impregnation, which made the search much more difficult.

Epicrisis.—The clinical record of Case II, if taken in its entirety, might possibly justify a diagnosis of general paresis, especially when one considers how protean this mental disorder may sometimes prove, but it is certainly not a typical history. Among the gross and microscopical alterations, however, parietic lesions predominate and, despite the presence of certain histopathological features to which attention has been called, anatomically therefore there is little warrant for anything else but a diagnosis of general paresis.

In the beginning of the patient's hospital residence hysteria was given some consideration, influenced largely by data obtained from one source of the previous history. Hysteria, however, was soon abandoned for an organic psychosis, a psychosis dependent upon one or more coarse focal lesions, or perhaps a radiating focus, but in either case a lesion of luetic origin. The speech disorder, the right-sided motor weakness, the deformity of the right hand associated with pseudo-athetoid movements, together with the positive Noguchi in the blood serum, had suggested this. The apoplectiform type of seizure with restricted motor residuals, while not unknown in general paresis, is far less common than the seizure of the epileptiform type, with resulting paresis more diffuse in character. The comparative rarity of the former type of seizure was perhaps the main factor in the staff conference decision for either an endothelial type of cerebral lues or a gumma. Indeed, anatomically there was some slight justification for such a view, but evidence for general paresis was greater. Of course, the possibility of a "lues general paresis combination" comes up for consideration, but if general paresis is a luetic and not a metaluetic condition, as at present seems very likely, the changes which this case exhibited would mean simply that we have in the same brain two types of luetic lesions, comparable in a way to the combined inflammatory and non-inflammatory form of cerebral lues described by Nissl.

The vascular alterations in the short stretch of the calcarine area of this case supplement the more extensive alterations found in Case I. Despite the limited area involved, more conclusive evidence of a transitional stage of amyloid degeneration was shown, in that some of the altered vessels gave positive microchemical reactions for amyloid—yellow staining with the Van Gieson procedure, amethyst with iodine green, and dark brown with iodine solutions.

As regards cerebral vascularization, here, too, the question of actual vessel proliferation arises. In view of what was said above with regard to a relative vascular increase and that some vessels are visible by present methods only after certain changes have taken place in their walls, it is possible that the great wealth of vessels displayed in the affected area of Fig. 14 may be more apparent than real, in so far as actual proliferation is concerned.

GENERAL SUMMARY AND CONCLUSIONS.

The process described above has been long known, as the cited references attest. Under different captions, cases exhibiting the self-same process, in varying stages of development, are recorded, and some of these cases are described in detail. One is surprised, therefore, at the assertion of Mignot and Marchand that they believed theirs to be the first case of amyloid degeneration of the brain reported.

Everyone who has familiarized himself with the literature on vascular alterations of the brain knows that the homogeneous changes which the walls of cerebral vessels frequently undergo may be widely distributed and the vessels involved intensively; that differentiating features concerning such changes have been established. All homogeneous alterations of vessel walls are not of the same character, whether as viewed from the standpoint of physical properties, staining reactions or etiological factors. It has not been the object of this paper to show up such well-known facts; rather its purpose has been to determine, on the basis of our present knowledge of brain histopathology and by approved technical methods, just how much one may claim on structural grounds as a reasonable interpretation of these peculiar deposits, in the literature of which cases dying of general paralysis have furnished the greatest number of exemplars.

Two cases of general paralysis of the insane, one with a rather typical clinical course, the other presenting symptoms apparently of focal origin which obscured the clinical diagnosis, showed at autopsy, in addition to the usual gross anatomical changes of paresis, the typical histopathological lesions of the disease. In one case (Case II) there were added certain proliferations of the cells of vessel walls, indistinguishable from histopathological lesions of the endarteritic non-paretic type of cerebral lues. Other alterations present in both cases were certain glistening, grayish or "fish-flesh" appearing, homogeneous deposits, visible to the unaided eye and limited chiefly to the cerebral cortex. In Case I they were small, for the most part discrete, thickly sown in the frontal and parietal areas and found in other portions of the cortex. In Case II this type of alteration was restricted to a portion of the right calcarine area. Here, however, the macroscopic appearance was that of a confluent mass. Microscopically,

the process was shown to have involved the mesoblastic apparatus by the deposition of stuffs in the walls of blood vessels which eventually converted them into structureless masses. Many of the apparently extravascular deposits proved to be only residuals of vessels, the lumina of which had become obliterated, or groups of vessels which had coalesced as the space between them had become annihilated by the encroachments of their respectively thickened walls, while the remainder not so classed could be reasonably interpreted as deposits within the meshes of the adventitial net-like proliferations exhibited by many vessels. Moreover, the process brought to light a richer vascularization than is usually shown in the most pronounced type of the atrophic parietic cortex. The study of this rich vascularization in a general way confirmed the contentions of Cerletti, namely, that what heretofore has been looked upon as actual vessel proliferation in the brain, in the majority of instances, is more apparent than real. The microchemical differences which these deposits exhibited led one to conclude that, despite the wide distribution in Case I and the extent to which surrounding structures had been compromised, the process was still in a stage of devolution, with an amyloid degeneration as the goal. The tannin-silver method in demonstrating the connective tissue invasion of nervous structures by a net-like extension of the proliferated adventitia of blood vessels added not only confirmation of the previous observations of Snessarew and Achucarro, but furnished the final link in the chain of evidence that in these two cases the process played itself out in the mesoblastic apparatus.

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EXPLANATION OF PLATES.*

FIGURES 1-13 ARE FROM CASE I, 14-18 FROM CASE II.

- FIG. 1.—Bielschowsky's method. The homogeneous deposits are shown in all cortical laminæ but sharply delimited from the white substance Zeiss a*, no oc., bellows 292.5 cm.
- FIG. 2.—Frozen section from material fixed in Weigert's glia mordant Van Gieson's staining. Homogeneous deposits involving considerable portions of vessel wall, small globular masses and even finely granular deposits in the same vessel; numerous occluded vessels, singly and in groups which have coalesced, surrounded by relatively large clear spaces; no appreciable cellular or fibrillary gliosis. Zeiss 8 mm. apochromat, comp. oc. No. 4, bellows 125 cm.
- FIG. 3.—Bielschowsky's method. The media of a small artery is shown converted into a homogeneous mass, the adventitia and intima unaffected apparently. Zeiss 2 mm. apochromat, no oc., bellows 100 cm.
- FIG. 4.—Van Gieson's stain. Small vessel in molecular layer of cortex, left paracentral lobule. Somewhat eccentric development of the process, adventitia involved, endothelial cells still visible, lumen patent. Zeiss 8 mm. apochromat, comp. oc. No. 4, bellows 165 cm.
- FIG. 5.—Van Gieson's stain on material as in Fig. 2. Typical perivascular infiltration of G. P., occluded and partially occluded vessels, one of the deposits, as it were, flowing around and between the plasma cell infiltrate. Zeiss 8 mm. apochromat, comp. oc. No. 4, bellows 125 cm.
- FIGS. 6 and 7.—Histological technics as in preceding figure. Vessels of white substance surrounded by an edema-like area, in Fig. 6, scant infiltration, in Fig. 7, typical G. P. infiltrate, dilated perivascular space traversed by fibers of connective (mesoblastic) tissue proliferation. Zeiss 8 mm. apochromat, comp. oc. No. 4, bellows 67.5 cm.
- FIG. 8.—Achucarro's tannin-silver method. Net-like proliferations of the adventitia which invade the surrounding nervous structures and anastomose with similar proliferations in nearby vessels. Zeiss 8 mm. apochromat comp. oc. No. 4, bellows 67.5 cm.
- FIG. 9.—Technics and photographic details as in Fig. 8, but here the vessel photographed is from the white substance and corresponds in location and type of alteration to the vessel pictured in Fig. 6.
- FIG. 10.—Bielschowsky's method, section of cortex. The fibrillary proliferations surrounding the vessel here shown are interpreted as principally of mesoblastic origin. Though this method does not differentiate as the tannin-silver procedure, careful study convinces one of their direct continuation with at least some of the fibers in the vessel wall; no deposits within the meshes of the fibers. Zeiss 8 mm. apochromat, comp. oc. No. 4, bellows 80 cm.

* All figures in reproduction from original photomicrographs have been reduced one-third.

FIG. 11.—Van Gieson's stain. The homogeneous masses either side the vessel sectioned longitudinally are interpreted as the altered branches given off from the central uninvolved vessel. Zeiss 8 mm. apochromat, comp. oc. No. 4, bellows 67.5 cm.

FIG. 12.—Frozen section from material fixed in formalin, section treated with alcohol for ten minutes, then stained with Weigert's elastica stain. Here innumerable, apparently extravascular deposits, interpreted, however, as vascular, are shown, for the most part discrete, but confluent masses still showing the independent character of the globules composing them are also exhibited. Photographic details as in Fig. 11.

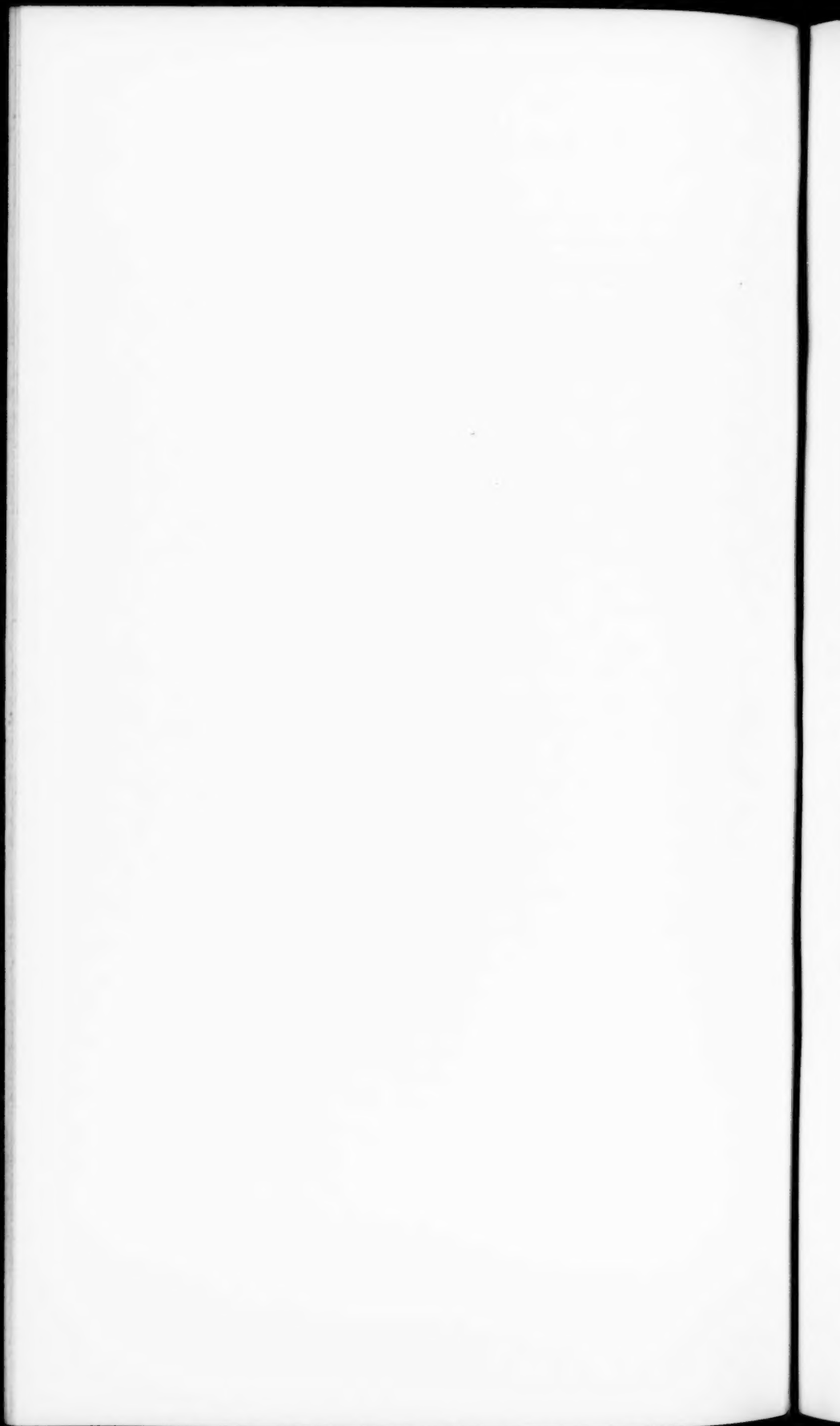
FIG. 13.—Histological technics and photographic details as in Fig. 10. Here, however, in what is conceived as a mesoblastic connective tissue proliferation proceeding from the vessel seen slightly above the center of the photograph, small homogeneous masses are shown within the meshes of the net-like proliferation.

FIG. 14.—Van Gieson's stain on material fixed in alcohol, celloidin imbedding. The section from right calcarine area shows the focal disposition of the process in Case II and the apparent great increase of vessels within the affected area. Zeiss AA, no oc., bellows 170 cm.

FIG. 15.—First temporal, left, toluidin blue after Nissl to show the paretic changes and to compare with Fig. 14 from the same case. Note the perivascular infiltration and the disturbance in the third lamina. Zeiss AA, no oc., bellows 187.5 cm.

FIG. 16.—Toluidin after Nissl from a section including a portion of the focalized area shown in Fig. 14. Note the glistening, somewhat waxy, appearance of the altered vessels, which look not unlike urinary casts, and the absence of any appreciable cellular gliosis.

FIGS. 17 and 18.—Van Gieson's stain on material fixed in Weigert's glia mordant from the focalized area in right calcarine area. In the longitudinally coursing vessel at the right (Fig. 17) the deposits are shown in varying sizes, the lumen still patent, while the vessels shown above and slightly to the left are occluded and the deposits are in larger masses. In Fig. 18 a large glia cell is shown, apparently in the act of engulfing one of the deposits. Both photographs are from the same section. Photographic details as in Fig. 11.



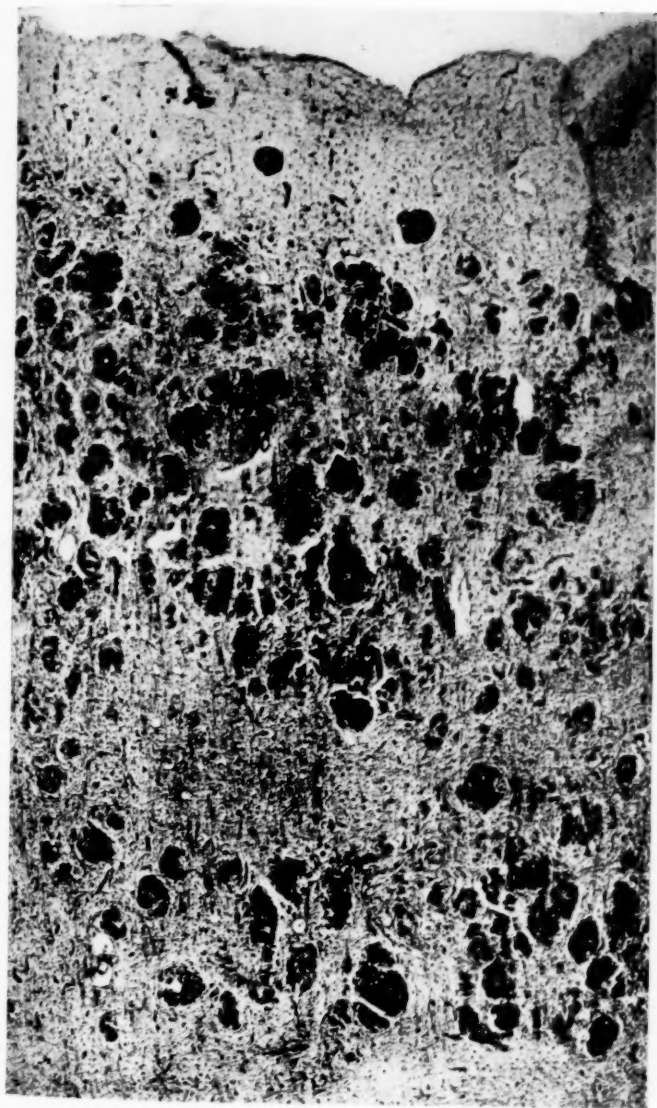


FIG. 1.

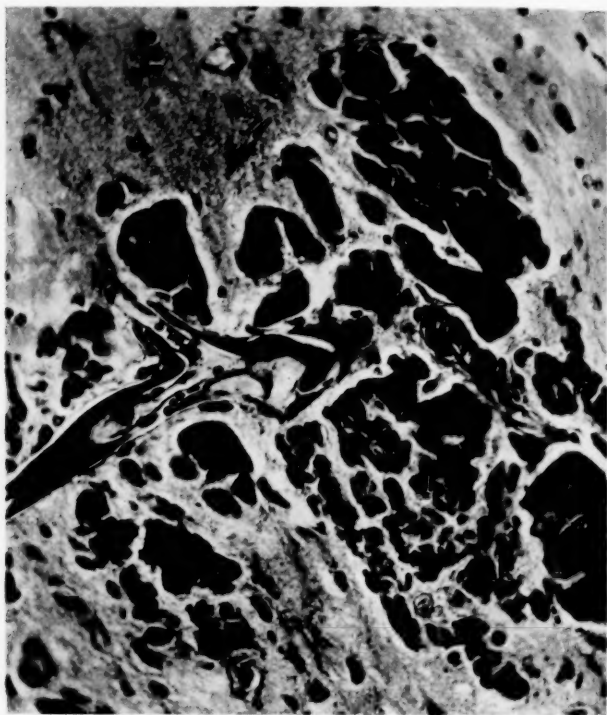


FIG. 2.



FIG. 3.



FIG. 4.

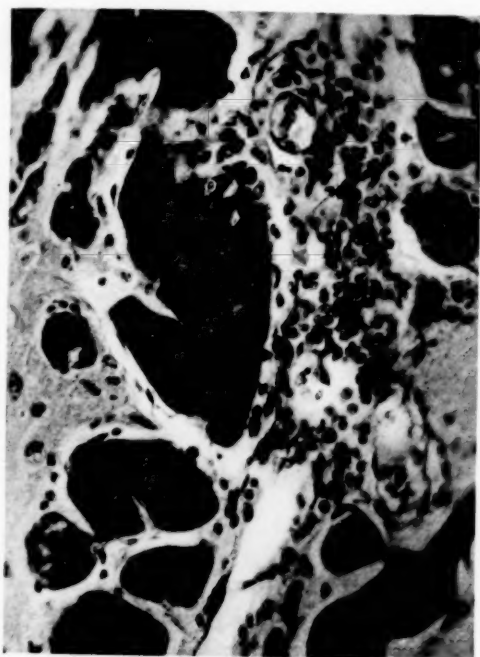


FIG. 5.



FIG. 6.

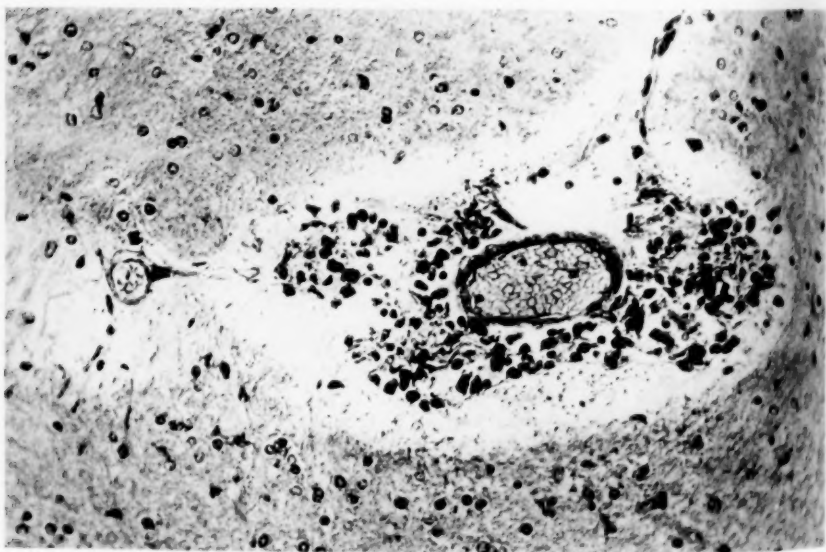
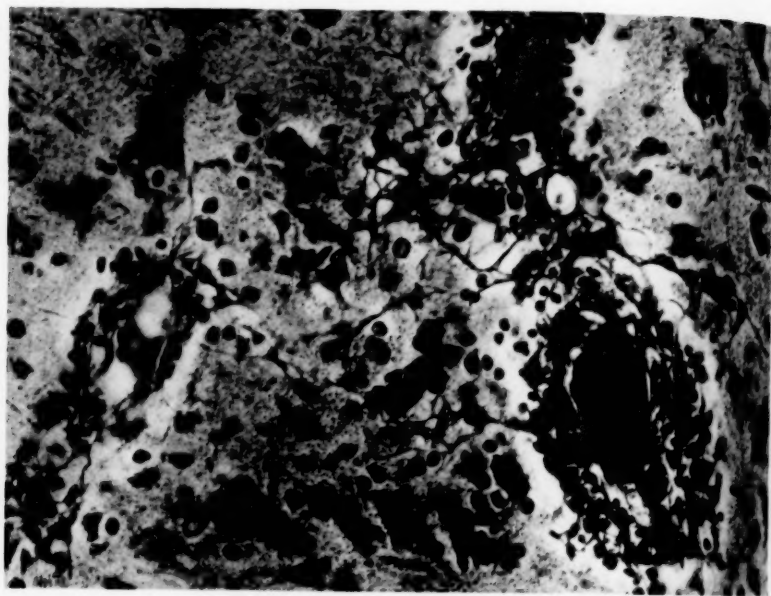




FIG. 9.



FIG. 10.



FIG. 11.

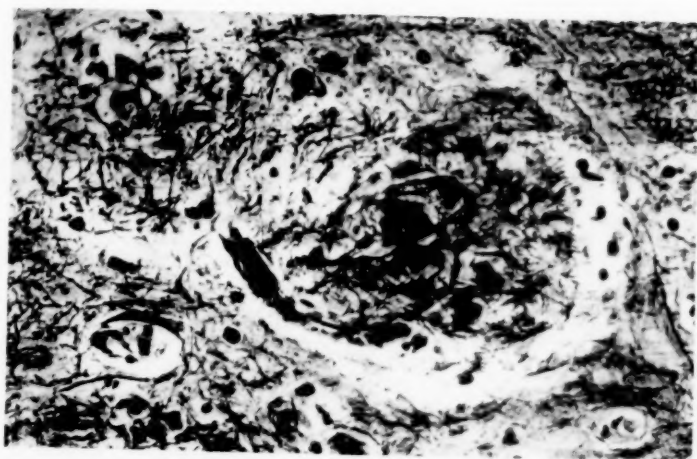


FIG. 13.



FIG. 12.

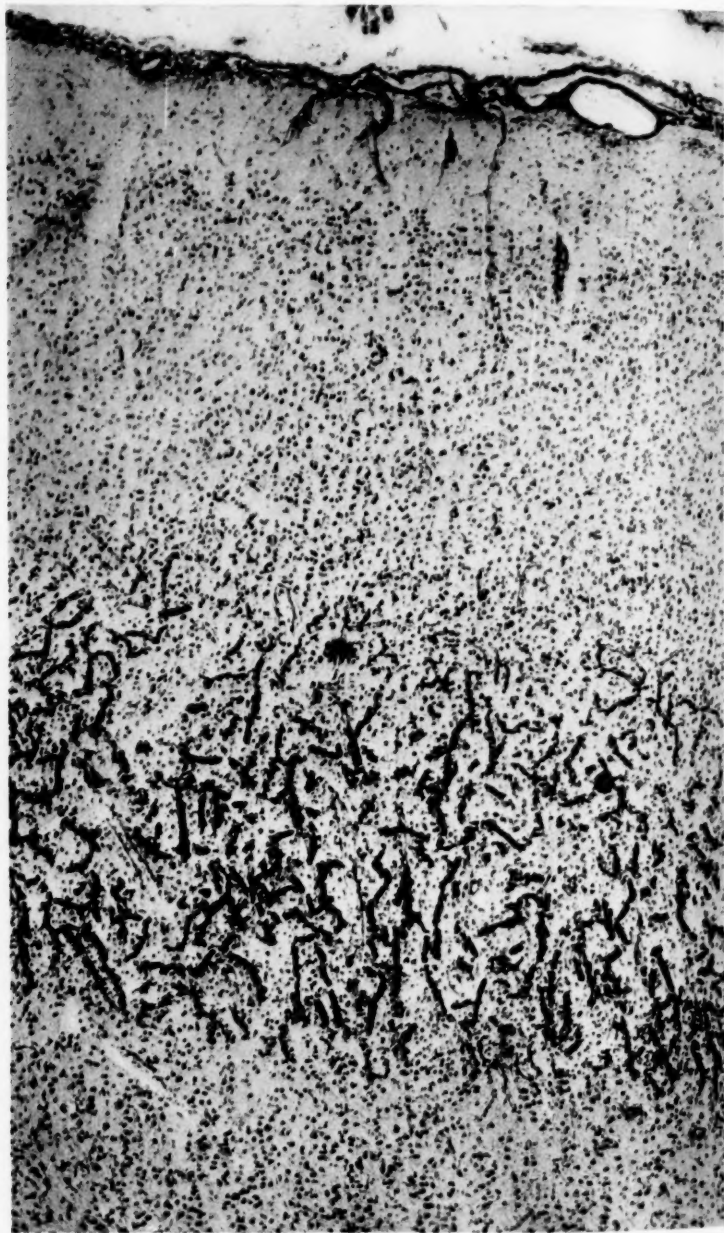


FIG. 14.

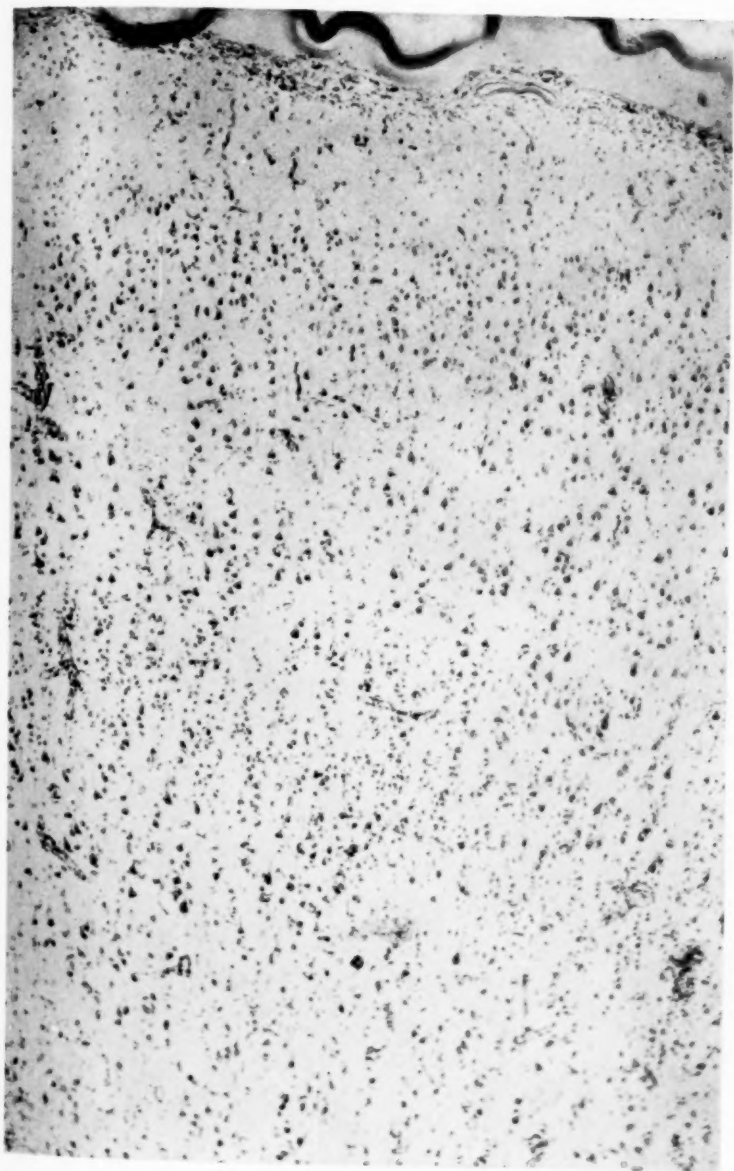


FIG. 15.

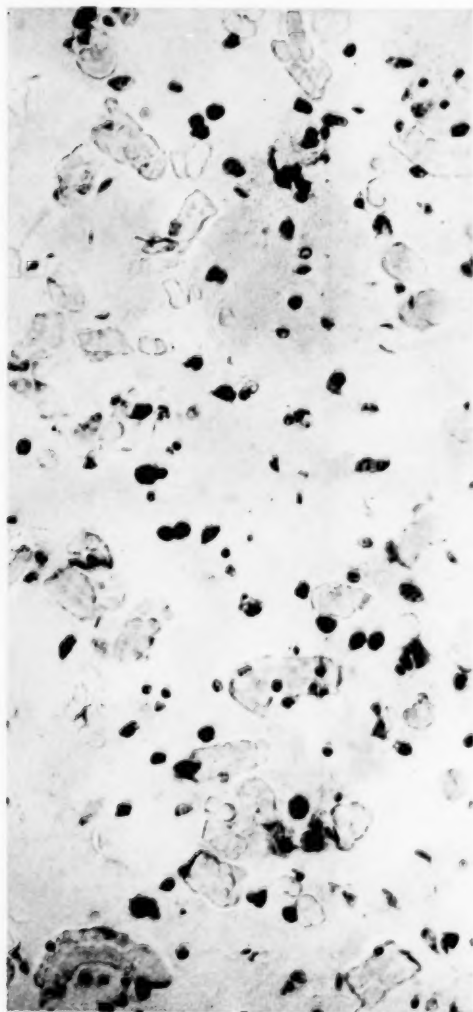


FIG. 16.

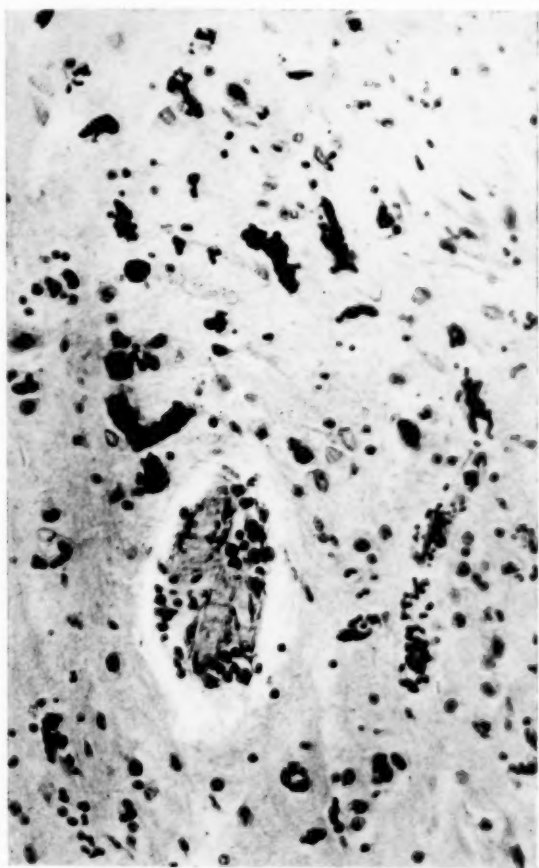


FIG. 17.

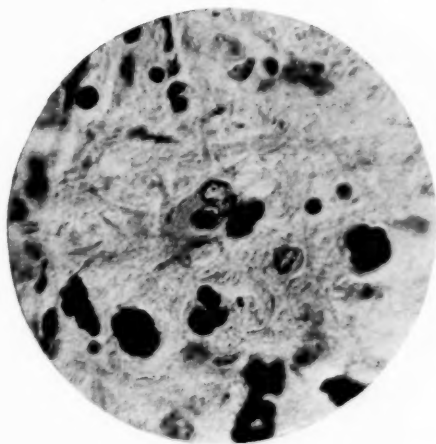


FIG. 18.



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PSYCHOSES FOLLOWING APOPLEXIES.*

By JOHN H. W. RHEIN, M. D.,

Professor of Diseases of the Mind and Nervous System at the Philadelphia Polyclinic and College for Graduates in Medicine, Neurologist to the Howard Hospital, Physician to the Philadelphia Home for Incurables, Philadelphia, etc.

A review of the literature will reveal the fact that post-apoplectic psychoses have received less consideration than the subject deserves, in fact not a great deal has been written about this symptom-complex.

That a perverted mental state occurs after an apoplexy in a certain number of cases has always been recognized, but the textbooks on the whole have described this condition in a more or less perfunctory manner.

The usual and best recognized form of mental change after an apoplexy consists of a simple moderate intellectual defect characterized by failing memory, emotionalism and defective will. Beside this, however, there may develop a progressive dementia, best described as dementia post-apoplectica.

But more rarely there occurs a certain mental state which has features which are more or less characteristic of a post-apoplectic psychosis. It is to illustrate the last, that I venture to report two cases which recently have come under my observation in private practice and which I have had the opportunity of studying from the very onset of the mental symptoms, an event which is not often afforded the alienist who is more apt to be called to the care of such cases later in the course of the disease.

The following cases are practically identical in their clinical features and seem to present a phase of post-apoplectic psychoses which is infrequently observed.

CASE 1.—M. H., aged 54. Father died of pneumonia; mother died of apoplexy and showed some mental change before the attack. A maternal uncle died of apoplexy, and a maternal sister died in an institution for the insane. Two brothers were living and well. One brother died of tuberculosis and one brother in infancy.

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.



- FIG. 11.—Van Gieson's stain. The homogeneous masses either side the vessel sectioned longitudinally are interpreted as the altered branches given off from the central uninvolved vessel. Zeiss 8 mm. apochromat, comp. oc. No. 4, bellows 67.5 cm.
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- FIG. 16.—Toluidin after Nissl from a section including a portion of the focalized area shown in Fig. 14. Note the glistening, somewhat waxy, appearance of the altered vessels, which look not unlike urinary casts, and the absence of any appreciable cellular gliosis.
- FIGS. 17 and 18.—Van Gieson's stain on material fixed in Weigert's glia mordant from the focalized area in right calcarine area. In the longitudinally coursing vessel at the right (Fig. 17) the deposits are shown in varying sizes, the lumen still patent, while the vessels shown above and slightly to the left are occluded and the deposits are in larger masses. In Fig. 18 a large glia cell is shown, apparently in the act of engulfing one of the deposits. Both photographs are from the same section. Photographic details as in Fig. 11.

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That a perverted mental state occurs after an apoplexy in a certain number of cases has always been recognized, but the text-books on the whole have described this condition in a more or less perfunctory manner.

The usual and best recognized form of mental change after an apoplexy consists of a simple moderate intellectual defect characterized by failing memory, emotionalism and defective will. Beside this, however, there may develop a progressive dementia, best described as dementia post-apoplectica.

But more rarely there occurs a certain mental state which has features which are more or less characteristic of a post-apoplectic psychosis. It is to illustrate the last, that I venture to report two cases which recently have come under my observation in private practice and which I have had the opportunity of studying from the very onset of the mental symptoms, an event which is not often afforded the alienist who is more apt to be called to the care of such cases later in the course of the disease.

The following cases are practically identical in their clinical features and seem to present a phase of post-apoplectic psychoses which is infrequently observed.

CASE I.—M. H., aged 54. Father died of pneumonia; mother died of apoplexy and showed some mental change before the attack. A maternal uncle died of apoplexy, and a maternal sister died in an institution for the insane. Two brothers were living and well. One brother died of tuberculosis and one brother in infancy.

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

The previous history was negative, except that for some years she has suffered from pelvic trouble, dependent upon an anti-flexed uterus. The menopause occurred at 49 years of age.

For two or three months before the attack of apoplexy she had complained of nervousness consisting of irritability, being readily disturbed upon slight provocation and of a tendency to fall asleep in the trolley cars. There was also sugar found in the urine on one occasion. Under appropriate diet and general measures the sugar disappeared and there was considerable improvement in her general condition.

On January 14, 1913, she fell to the ground without loss of consciousness. This occurred on two or three occasions during the ensuing two days, and finally on the 16th of January after falling again the left arm and leg and left side of the face became paretic. Consciousness was not disturbed and the mental condition was good. On the fourth day the patient became emotional and depressed, complaining of headache and the paralysis became more profound until at the end of ten days she was completely paralyzed in the left side of the face, in the lower distribution and in the left arm and leg.

About the end of the first week there developed restlessness, depression, complaint of pain in the head and affected limbs. Less than three weeks after the attack she became noisy by night and during the day she was very despondent, crying much of the time, shouting for help and complaining that those about her were not affording relief and were neglecting her.

Later she believed that many people were in the same bed with her, that she had two heads and that the bed was on fire. She became completely disoriented as to time and place.

These mental states at first occurred in attacks lasting one or two hours. In the interval she moaned with pain, or cried bitterly and was depressed.

The episodes varied in character. She was disoriented all of the time. She was always away from home, sometimes in a hospital attached to a church in an adjoining parrish; sometimes she was living in another world; sometimes she was in a convent and controlled by priests; sometimes she was confined in a house of ill-fame and was surrounded by half-dressed men and women from whom she could not escape. She had been taken to the house of ill-fame by a young fellow who drove her there after forcing her into a cab. This was a great disgrace and the day following this episode she thought she should go to communion.

Later these delusions persisted for many hours and days, changing from one to the other from time to time. They showed the following variations: She had gone to visit her parents (who were dead); liniments applied to her limbs were poison; the nurse put poison in her food and the medicines injected or given by mouth were poison. Paint was put in the milk which she refused for this reason. She wept bitterly over the funeral of a big fish. The Queen of Sheba had presented her with jewels. She was greatly depressed over the belief that she was gradually becoming a negro. Her bed was a carriage and her feet and legs the horses. She thought she was dead and in a coffin, and talked a great deal about funerals and undertakers.

Her legs were fish and her hand a baby. Her leg had been crushed in an accident and had been amputated. She had two heads.

She manifested most of the time hallucinations which varied in character. Italians were in the house, and dogs wandered about her bed. Repeatedly large numbers of fish filled the air of her room, some walking, some flying. The faces of maimed children and babies were often seen.

She was very noisy especially at night. She resented the lateness of the visits of her physicians and when they moved her during examinations giving her pain, it was done on purpose to hurt her. She repeated words and phrases over and over again. (Perseveration.)

This condition persisted until March 30, 1913, two months after the attack when she underwent a febrile reaction lasting ten days in which the temperature rose to 102° , and was associated with vomiting and abdominal distention. After this attack she improved quite rapidly in all ways, until three weeks later she became quite normal mentally.

She ceased to complain of pain and there was also considerable return of power in the paralyzed limbs. She improved to the point of being able to take a few steps assisted.

An early and persistent symptom was incontinence of the urine and faeces. The examination of the heart and lungs was negative and the urine showed at times traces of albumin, and occasionally a few granular and hyaline casts. At no time could the kidneys be said to be a factor in the causation of the mental or other symptoms. The arm jerks and knee jerks were increased and more so on the left side and the Babinski phenomenon was present on the left. No change in sensation was noted, and there was no hemianopsia.

She stated after her recovery mentally that she thought that all the time she was sick she was in an opium den, or that she had been travelling or was among enemies. The hypodermics administered during her illness she believed was associated in her mind in some way with the morphine habit which she thought she had contracted. She remembers seeing horrible sights but the most painful memory was that she was confined in some house and could not get away to go home.

The mental condition in this case may be summarized as follows: There were maniacal outbursts; delusions mainly painful and persecutory; hallucinations, phantasmagoric and depressing; disorientation, and perseveration. Especially to be noted is the great complaint of pain in her head and palsied limbs, and the depressive state.

CASE 2.—A. C., aged 64. Father died at 77 of senile change and heart disease; mother died at an early age of phthisis; one brother died of heart disease; otherwise the family history is negative.

Fifteen years before the attack of apoplexy she had had an attack of neurasthenia and thereafter began having stomach trouble which persisted until a year before her attack, when a rest cure was given and

she recovered, remaining in good health until October 3, 1912, when she complained of continual pain in the right side of her head. On October 4, she awoke and found her left arm useless but she recovered from this in the afternoon except that she dropped things from her hand from time to time.

On October 7, 1912, she fell down from weakness in her left leg and felt weak in her left arm. At the same time the pain in her right temple became intense. On October 12, 1912, suddenly there was some confusion of speech and on the following day she lost power in the left arm and leg, the paralysis becoming complete in four days. From the beginning there was continual complaint of pain in the right temple and in the left arm and leg. She was very restless, moaning constantly and complaining that those about her would not give her relief. Two days later she showed some mental confusion. She believed she was on a boat, saw relatives in her room (who live miles away), thought she was in Atlantic City and saw soldiers and processions in her room. Then in a few days she saw phantoms and conversed with imaginary people. She was noisy and cried out at night and passed her urine involuntarily. She talked constantly, except when asleep, complaining of the unkindness of those about her, turning against her daughter her nurse and doctor and slept only under the influence of hypnotics.

She believed she had gone to New York on the 1.45 p. m. train and had come back at 6 p. m. the same day. She said she was not tired and stood the journey very well indeed, having walked around a good deal in New York and had gone to see a play called, "When Bunty Pulls the Strings."

She was most of the time very much disoriented as to time and place. She was very noisy especially at night, complaining a great deal of pain in the head and affected limbs and shrieking so loudly that the neighbors could hear. She was depressed most of the time abusing those about her for not giving her more relief. She often saw dogs and children's faces about her.

On December 2, 1912, there was some improvement in her mental condition for a short time but in a few days again she became irrational, very confused and talkative, moaning and crying. She was in a pulman car again, did not recognize her daughter, her doctor, or her nurse, talked continuously to imaginary people, and was still very noisy.

On January 4, 1913, she became stuporous, moaning and crying loudly, a condition which persisted until about March 22, when she began to clear up, mentally, recognizing everybody and conversing intelligently. Her mental condition continued very good for a month when, after an attack of the mumps, she again complained of great pain in the left leg and arm and cried most of the time although otherwise was clear in her mind.

The heart and lungs at no time showed any abnormality and the urinary analysis was negative. The reflexes were generally increased, more markedly so on the left side. No sensory changes were noted and an examination of the fields of vision failed to reveal any hemianopsia.

To summarize, the mental state was characterized by mild hallucinations; delusions somewhat persecutory and depressive; disorientation and maniacal outbursts. As in the first case cited the complaint of pain in the head and paralyzed limbs was a marked feature.

In both of these cases there was evidently a thrombosis, probably in the basal ganglia, if the central pain complained of in the affected limbs can be said to have a localizing value. Recently I¹ studied the subject of central pain and concluded that the most frequent site of the lesion causing this phenomenon was the basal ganglia especially the optic thalamus.

These two cases illustrate a form of psychosis after apoplexy which is I believe of not very frequent occurrence.

It is unlike the dementia post-apoplectic of Ziehen,² Bianchi,³ or the post-apoplectic Schwachsinn of Kraepelin⁴; or the dementia occurring after apoplectic seizures described by Oppenheim,⁵ Griessinger⁶ and others. These are the usual forms of post-apoplectic mental disturbances and consists of an alteration of the will and the affective faculties associated with a diminution of the intelligence. The patient is restless, irritable, sensitive and shows some change in the character; his memory fails; he is childish; he exhibits shamelessness and other changes in the ethical viewpoint.

My cases resemble somewhat, but still differ from those described by Dupré⁷ which exhibit symptoms characterized by excitation, depression, absurd acts, incoherence, demential manifestations, cerebral automatism, incoordination, insomnia, complaints of injury, profanity, incontinence, constituting a *démence agitée*.

While Dupré and others describe post-apoplectic mental symptoms characterized by delirium, hallucinations, hypochondriacal and depressive mental states with the same characteristics which my cases exhibited, it is not clear that these symptoms constitute an acute curable psychoses; but rather that they are added to or are a part of a progressive and incurable dementia.

It must be understood that both of my cases recovered their normal mental state though perhaps with some simple enfeeblement and certainly not to a full mental vigor, and were therefore not cases of dementia upon which was grafted a delirium, a mania,

a hallucinosis or what not but were examples of an acute psychosis of a curable type.

Légrand du Saulle* in 1881 gave a very good description of the mental state following apoplectic seizures. He divided the symptoms into three classes.

(1) Those in which the intellectual decline is consistent with a civil and moral responsibility and consists of some change of the character and a weakening of the will; (2) those cases in which the patient is sensitive and emotional with feeble memory and lack of decision and spontaneity, a condition which he says cannot be called either dementia or yet a normal mental state; and (3) those cases in which the patient is more or less disoriented, forgets the identity of the people surrounding him, in which judgment is lost, in fact in which there is a true dementia. This includes also cases in which there are delirium, apprehensions and fears, ideas of persecution, depressive ideas, hallucinations at night and maniacal states, a condition which may go on to a complete dementia.

As far as the symptomatology is concerned my cases fall into the last class described except that no true dementia was at any time manifested by my patients.

Ziehen described a mental state as the result of a thrombosis bearing marked resemblance to the symptoms presented by my cases; namely, disorientation, delirium, perseveration, and particularly a weakening of the attention. He also stated that symptoms of Korsakoff's disease may be manifested.

It will be noted that the delusions in my cases were mildly persecutory in character. This has been noted by Dupré, Lwoff,* Légrand du Saulle, Clouston" and Magnan," in their descriptions of the delusions of psychosis after apoplexies. Benon" observed this type of delusions in 24.1 per cent of his cases.

In my cases there was a hypochondriacal as well as a depressive tinge to the delusions and this has been observed by Ferrière," Dupré, Magnan and Benon.

There was a distinct tendency in these cases to maniacal outbreaks which occurred mainly at night, and were paroxysmal, a condition which had been noted and described by Lwoff, Dupré and Griessinger.

Hallucinations occurred in my cases and persisted throughout the entire course of the disease and were persecutory, phantasmagoric, and depressive in type. The hallucinations occurred during the late afternoon or at night which is characteristic.

They are described by du Saulle as unhappy, persecutory and frightful. In Dupré's experience they consisted of phantoms, animals, terrifying forms and painful hallucinations of smell. The terrifying nature of the hallucinations of sight have been noted also by Charon,¹⁴ and Magnan. Sometimes hallucinations of taste, odor and general sensibility have been observed. (Dupré.) They were presented according to Benon in 17.35 per cent of one hundred cases of hemiplegia.

Position of lesion. Benon has shown that in 51.5 per cent of the cases of post-apoplectic psychoses the palsy is left-sided, and in 48.9 per cent right-sided, therefore practically showing as he believed no preference for either side.

According to Luys,¹⁵ lesions in the left side were almost always accompanied by emotional excitation coexistent with pain in the palsied limbs. This is the only reference to pain in the affected limbs that I was able to find in the literature. It will be remembered that both my patients complained of great pain, spontaneous in character, before any symptoms of psychosis developed and persisted until the mental condition cleared.

Lesions of the first temporal region are said especially to give rise to emotional disturbances (Brissaud,¹⁶ Luys, and Seguin¹⁷) and softening of the corpora striæ, the insula and the external capsule, Luys believed were also characterized by emotionalism.

Psychic symptoms according to Dupré predominated in alterations of the anterior part of the brain especially in the frontal lobes and in affections of the corpus callosum.

Intellectual disturbances with speech defects was recognized by Hoch as due to implication of the large ganglia and according to Clouston the most frequent site of the lesions in these cases was the basal ganglia. Lesions of the thalamus causes great emotivity according to Bianchi a fact born out by the observations of Holmes and Head¹⁸ and others.

Lesions of the left side of the brain cause defects of intelligence, Bianchi stated, much more than on the right side due to the loca-

tion of the center of the functions of speech on the left side. Journiac²² described a case of melancholia with suicidal and homicidal impulses as a result of hemorrhage in the lenticular nucleus without palsy.

Dupré believed that the mental disturbance was proportional to the extent of the lesion and the extent of the cortex implicated.

Ziehen stated that after a thrombosis the intellectual decline is more intense than after embolism or hemorrhage. On the contrary Kraepelin agreed with Mingazini that it made no great difference whether the lesion was a hemorrhage or a thrombosis.

The mental symptoms developing after an apoplexy are looked upon as due to the diffuse vascular lesion of the brain which is associated with the hemorrhage or thrombosis (Ziehen, Charpentier,²³ Ricksher,²⁴ Paton²⁵). Oppenheim called attention to the fact that the dementia was seldom the result of the seizure or caused by the lesion itself merely, but was rather the outcome of this, plus general disease of the cerebral vessels and their consequence, and Bianchi also believed that the arterial sclerosis explained the mental symptoms after cerebral softening.

Autointoxication according to some authorities is the cause of the mental phenomena. Charpentier called attention to this, and Dupré believed that mental confusion with disorientation and anxious states may be associated with hepatic and renal insufficiency which appear to be related to the toxic and infectious nature of the psychic phenomena.

Symptoms of Korsakoff's disease which occurs in some cases, an occurrence described by Ziehen, suggests a toxic origin for this condition.

In these cases it is to be noted that there is in some instances a predisposition (Dupré and Magnan²⁶), and the rôle played by heredity (Clouston) and alcohol must not be overlooked (Lwoff).

The prognosis is unfavorable in the usual forms of psychoses described. The dementia is looked upon as being progressive (Ball and Chambard²⁷ and Benon), and is said to be worse in those cases in which there are foci of softening. Benon believed that the mental troubles rarely ameliorate. On the contrary the cases herein described show that there may occur a form of post-apoplectic psychosis which is recoverable.

A mental state preceding the attack has been described by Savage¹¹ expressing itself as irritability, emotionalism, poor memory, simple pain in the eyes, and hallucinations of hearing. Ball and Chambard stated that it was rare for the attack not to be preceded by sensory and intellectual troubles for weeks or months due he believed to atheromatous states of the cerebral arteries. A prodromal stage was described by Benon consisting of antero-grade amnesia, diminution of attention, modification of character, delirious ideas, excitation, depression or confusion. No mental symptoms preceding the attack were noted in my cases.

Evidence of autointoxication either from renal or hepatic insufficiency was lacking in my cases. There was in the first case described a distinct element of hereditary predisposition and both cases were of an age when arterial sclerosis of the brain could be expected to be present.

In conclusion I wish to emphasize the following features of these cases, namely, the acuteness of the attack; the curability of the psychosis; the presence of pain in the head and in the affected members; the depressive, hypochondriacal trend of the mental symptoms; the presence of perseveration; the occurrence of hallucinations of an unpleasant type and finally maniacal outbursts, the hallucinations and maniacal manifestations being worse at night.

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STUDY OF HALLUCINOSIS.*

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The present study embraces 27 cases observed at various intervals during a period of seven years. In the largest majority of them (19) the hallucinations either remained intact or disappeared for longer or shorter periods of time and reappeared. Eight patients, after presenting hallucinations as the only morbid manifestations for periods varying from five months to two years, eventually developed delusive ideas and presented distinct classical psychoses. Evidently in this latter group the hallucinations appeared to be as the earliest manifestations of the future psychoses. In the first series the hallucinations existed either as obsessions (7 cases), and they were therefore "obsessive hallucinations" or else they accompanied obsessions (12 cases). The latter group constitutes "hallucinatory obsessions."

OBSESSIVE HALLUCINATIONS.

The seven cases of the first series with this disorder presented the following varieties:

One patient, a middle-aged man, had several attacks of acute alcoholism during a period of two years prior to development of the hallucinations. He recovered totally from alcoholism and resumed his occupation of banking which he conducted well. He was highly emotional. On one occasion, viz., two years later he sustained a shock (death in the family) and he developed the following phenomena: When walking on the street, he heard children running after him and calling him vile names. He would turn around and see nobody. While sitting in the bank, suddenly he would hear an inner voice "to use his own expression" telling him not to do it. The condition continued in spite of every effort on the patient's part to get rid of it. He realized the absurdity of it; he knew, he said, that no children ran after him and that nobody told him to stop doing it, because he saw no one, but he could not relieve himself of the auditory images. At various times he was obliged to discontinue his work or remain in his room. The hallucinations occurred only when he was on the street or in his place of business. The patient is still living and pursuing his occupation. They do not occur as often as formerly, but they have not disappeared. No other abnormality in his mental sphere has ever been observed.

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

The second patient, a girl of thirteen years, lost her mother quite suddenly (she died after an operation). Five weeks later she developed a visual hallucination. Every night when she was ready to retire, her mother in company with another woman appeared before her in white. She felt her hair being caressed by her mother's hand. The child was naturally frightened and for hours laid awake. She knew, she said, that dead ones cannot return, she realized the impossibility of it. Nevertheless she saw her mother at her bedside. The vision would appear only when no one else was in the room. For protection the girl had a cousin to sleep with her in the room. As long as the latter was awake, there was no hallucination, but as soon as she fell asleep, the patient saw her mother at her bed. The condition lasted for eleven months and then disappeared.

The third patient, a man of forty, tailor by occupation, served in the Spanish-American War. A year after the war he moved from San Francisco to Philadelphia. Here he met with many financial reverses and domestic misfortunes. He then developed visual hallucinations. When alone in the room or when on the street in the evening he would see corpses of the wounded soldiers scattered around him. He was convinced of the unreality of the condition. Nevertheless it was persistent and in spite of every mental effort he could not get rid of it. He would avoid remaining alone and going out in the dark. After a period of five years the condition is still present with the same intensity. No other abnormality in the mental sphere could be detected.

The fourth patient, a married woman of thirty-two, suffering from tic of the face, after a difficult confinement with instrumental delivery, during which the new-born child died, suffered for a period of three weeks from profound asthenia. Gradually she recovered and while convalescing in the country where she was taken, she developed visual and auditory hallucinations. She began to hear the dead child crying and saw the little hands outstretched towards her. The hallucinations would only occur at night. She often discussed with me the unreasonableness of those hallucinations; she firmly believed, she said, that they were the result of the exhaustion she suffered after the birth of the child. The condition lasted eight months. At that time she became pregnant. Curiously enough, they then disappeared to reappear after the confinement which again was difficult. The newly born child, which is still living, she said, brought back to her memory the dead infant and again she commenced to hear the crying and to see the hands of the dead one. They disappeared four months later and reappeared after the third confinement, which occurred two years later. The patient still has these hallucinations after five years of existence, but lately the visual images have disappeared. The patient only hears the dead child. She is highly emotional, cries easily and presents a hysterical right hemianaesthesia with concentric contraction of the right visual field.

The fifth patient, a man of thirty-seven, married, bookkeeper by occupation, lost all his savings through an unfortunate investment. He worried considerably over it, broke down in health and left for a seashore resort to recuperate. While convalescing, he developed a peculiar graphic halluci-

nation: he would see himself writing checks. When he was reading and it was quiet in the room, and nobody was around him, he would suddenly see his hand on the table and writing in a check book. He fully realized the unreality of it as in the intervals between the hallucinations he could not find the checks he supposedly wrote. The condition lasted during the entire period of his sojourn at the resort, viz., two months. When he resumed his former occupation he was totally free from the hallucinations. A year later he had another attack of neurasthenia and again hallucinations developed but of a different character. He would see himself walking before the windows of the room while he was sitting in the room or lying in bed. In view of his consciousness being preserved he realized the unreality of the visual phenomena and considered it in a very light manner. The condition lasted three months. He recovered completely.

The sixth patient, a girl of eighteen, suffered disappointment in a love affair. For weeks she remained confined to her house, declined invitations and received no one. She lost considerably in weight and suffered from insomnia. She was sent to Europe on a trip from which she benefited greatly. Upon her return to the United States, while sitting once with her mother in the dining room, she heard her former lover's voice. (The young man died since and she knew it.) She sprang to her feet, but realized the unreality of it. Since then she kept on hearing his voice very frequently, on the street, in her home and even in the theater. When she consulted me, she told me that while playing the piano she was often compelled to discontinue her playing because of this "haunting" voice which she could not overcome. She knew perfectly well the impossibility of dead persons speaking. While the condition annoyed her considerably, nevertheless she was not alarmed by it. For a period of four months the hallucination persisted. It disappeared after a violent shock (a collision of the automobile in which she was riding with a friend). A year later the condition returned and again upon a strong emotion: she witnessed the drowning of a young man in the ocean. It persisted for six months with very brief intervals of amelioration. It is now two years since the last attack of hallucination disappeared.

The seventh patient, a girl of fifteen, following a fright of no great moment, developed an auditory hallucination. She heard a voice continually repeating the words "she will be killed." The voice did not appear to her familiar, she knew that no one was after her but she could not get rid of the voice. She hears it distinctly, she says. The disturbance annoyed her considerably. However beyond a slight irritability and depression, there was no indication of any serious mental disorder. The condition lasted eighteen months and she finally made a complete recovery.

In these seven examples of obsessive hallucinations we find all the elements of obsession, viz., irresistibility, emotional state, anxiety and total integrity of consciousness; the hallucination has here an independent existence and constitutes by itself an obses-

sion. All my individuals presented a marked pathological emotion, in all the hallucinations followed an emotion and in all the underlying basis was a state of lowered resistance created by some preceding emotional shocks, such as difficult confinement, financial reverses, deaths in the family.

The second group of twelve cases present examples of

HALLUCINATORY OBSESSIONS.

CASE 1.—Boy of fifteen of a neuropathic family, has been suffering from aboulia; when walking on the street, he could not step over a leaf of a tree, or a brick; when insisted upon he would be thrown into a state of anxiety, tremble, cry and fear. Soon he developed visual hallucinations: the sight of a brick or leaf would be constantly before him. Whether at the table or at work, he saw these two objects. Recovery from aboulia removed these hallucinations. Four years later the same disturbances returned.

CASE 2.—Girl of eighteen who presented in childhood several attacks of chorea, also enuresis for a number of years, developed a fear for having onions on the tables. As soon as they would be brought in the dining room, she would have to leave the table as otherwise she would be unable to continue her dinner. She cried and was exceedingly nervous when she would make an effort to overcome the sensation of fear. She realized the absurdity of the condition, but could not overcome it. Gradually she began to smell the odor of onion in every kind of food, even when this vegetable was not in the house. The condition continued for four years with intervals of amelioration or disappearance of the olfactory hallucinations.

CASE 3.—Middle-aged man, neuropath, suffered from folie de doute with especial reference to letter writing; he would tear the letters up a number of times before he would settle his mind on one to be mailed. He observed that after the letter was finally dropped in the mail box, the address of the envelope would continuously be before his eyes without giving him any relief for days.

CASE 4.—Middle-aged man, whose uncle and niece were confined to an insane asylum, was in constant fear of becoming infected through his contact with other people. In restaurants, in hotels, he feared to use forks, knives or napkins. Getting on the trolleys, he avoided touching the handles, the bars (*délire de toucher*). He reasoned that while in practical life it is impossible to avoid handling objects or meeting people, nevertheless he felt that he could not get rid of those thoughts. The condition lasted five years. During this time he developed hallucinatory images of visual nature: for weeks at the time he would have before him suffering faces of diseased people. They would disappear and reappear.

CASE 5.—Young woman of twenty-nine, single, with erotic tendencies, developed a fear of being constantly followed on the street by persons having immoral designs on her. She knew perfectly well, she said, that she could not accuse every man on the street of those thoughts, but the irresistible

thought was constantly with her. Soon she observed faces of men would suddenly appear before her when she was alone in her room. She would see them when she would get awake in the night. The patient was an intellectual woman. She realized the unreality of the condition but she was considerably disturbed by the persistence of it. She finally recovered.

CASE 6.—Middle-aged woman, obese, with bad family antecedents (epilepsy, insanity), conceived a fixed idea that she is being considered by everybody to be pregnant. She ceased menstruating ten years prior to this date and she gave everybody her age fifty-nine. She knew that such a thought was absurd, that none could possibly suspect her of being pregnant, but the thought was so persistent that it disturbed her considerably. Soon she began to hear remarks such as this: "Look at her" or "She is ready to be confined." She was tortured by the thought and the hallucination. At first she made every effort to overcome it, but failed. She then left town for several months and while away she recovered.

CASE 7.—A musician, twenty-three years of age, once after playing solo at a private entertainment, became very nervous and could not sleep that night. Since then he developed an extraordinary fear of playing before an audience. He could do it easily at home, or before a few friends, but as soon as he was invited to play in a public place he was seized with anxiety and fear and cardiac palpitation. In spite of all efforts to overcome it, he could not succeed. He then observed that someone would constantly speak so close to his right ear and say: "You will fail, do not try it." He heard it, he said, very clearly. It became very persistent. He would hear the voice wherever he went and as soon as he awoke in the morning, he would hear the voice only on the right side. He then decided to take up teaching and gave up definitely playing before the public. The condition persisted three and a half years. He finally recovered.

CASE 8.—A woman of thirty, developed a special penchant for hatpins. She bought them in large quantities. Once she happened to injure slightly her scalp while fastening on her hat with a pin. Since then she developed a fear of putting on her hat with her own hands. If she persisted, she would be thrown into a state of anxiety, would tremble and even cry. She was obliged to have invariably assistance. The condition lasted three months. Once she made an attempt to dispense with the assistance of a maid. The moment she raised her hands to her head, a red spot appeared before her eyes; she saw blood. The condition would repeat itself on subsequent days at each attempt to put on her hat. Gradually it developed into a continuous state. The blood spot was always before her. The fear of injuring herself with a hatpin became consequently more intense. Recovery from the hallucination followed at the end of eighteen months, but the obsessive fear lasted four years with brief periods of intermission.

CASE 9.—A girl of eighteen, sister of the preceding patient, accomplished pianist, developed a doubt as to her playing well certain pieces of music if she is seated on the piano stool in an upright position. She thought she could do better if she sat sideways. While realizing that scientifically a change of a sitting position has no bearing on the execution,

nevertheless, the idea "haunted" her. She could not resist the imperative desire to adopt the new position. The condition lasted a whole year when a new feature made its appearance. At that time she was given psychotherapy by persuasion method. Once when she attempted to overcome the obsession, and sat on the stool facing the piano, the moment she struck the first note she heard a voice saying, "it is wrong," "change your position." From that time on she heard those words as soon as she sat down at the piano. In a few weeks this auditory hallucination became so persistent that the patient could hear the words continuously. Recovery followed in eighteen months.

CASE 10.—Woman, cousin of the two previous patients, aged forty-two, suffered from kleptomania. Although she was a woman of means, she could not resist taking, in department stores, inexpensive articles, such as hairpins, hooks, buttons. When she returned home, she insisted upon having the objects sent back. A number of times she sought medical advice for the condition of which she was perfectly conscious and which she actually abhorred, but which she could not overcome in spite of her efforts. Once upon leaving a store with the stolen articles, she heard steps following her. She turned but saw no one. She went on and again she heard the steps, which followed her until she reached her home. Since then she kept on hearing steps behind her as soon as she appeared on the street. She appreciated the unreality of the condition, nevertheless she heard steps distinctly. She made a complete recovery at the end of two years.

CASE 11.—A young man of eighteen with a history of some psychosis in the family, but otherwise presenting no signs of insanity, suffered for a period of four years with an obsession as to his own mental faculties. He feared that he would lose his mind. Notwithstanding the fact that he occupied a responsible position, viz., managing a furniture factory and that at no time any complaint was made against his activities, he nevertheless could not get rid of the idea of eventual insanity. He was an ardent golf-player. Once during his favorite game, he overheard one partner speak of another that the latter could not last long and would go "crazy." Since then our patient whether on the street or in doors very often would hear the word "crazy." The condition is still persistent seven years after the onset. The patient realizes the absurdity of the situation.

CASE 12.—Man of twenty-eight, grocer by occupation, excessive smoker was obsessed like the preceding patient by the thought that he was going to lose his mind. The condition persisted for four years. He knew, he said, that he actually did not lose his mind as he carried on his business perfectly. Once he dreamed of an insane institution and saw himself among the inmates. Since then he would often see when he was alone, crowds of people walking towards him. He ridiculed the idea but in spite of his efforts he could not overcome the visual hallucinations. The condition lasted two years. Finally he recovered.

In these twelve examples of hallucinatory obsessions the following features can be brought out. The obsessive ideas developed before the hallucinations. The hallucinatory phenomena appear to be a continuation of the obsessive ideas or rather the external materialization of the latter. As soon as the hallucination has made its appearance, it does not substitute the idea but it exists conjointly with and reenforces the latter. Otherwise speaking the obsessive images assume an aspect characteristic of phenomena observed in general or special sensory sphere. Indeed we find here auditory, visual, verbal and olfactory phenomena. Like the original obsessive idea, the hallucinatory presentations developed and existed since within the field of consciousness. They remained so until their recovery took place in spite of their character contradictory to the conscious state. Therein lies evidently the reason of episodic at first and later of complete disappearance of both obsessions and hallucinations.

In the following series of cases, we find examples of obsessive phenomena, in which volitional inhibition grows gradually weaker and weaker and perforce the chief disturbances proportionally manifest themselves with greater power. We witness here a gradual transition into morbid states characteristic of genuine psychoses.

CASE I.—Middle-aged woman beginning her menopause, commenced to complain of seeing faces through the window as soon as evening approaches. The visions at first were particularly marked in the dark. She saw faces passing by the window and each looked into the room and disappeared. As they were all at first of a pleasant nature, she was rather amused by them. She often chatted about and ridiculed the vision. The condition lasted three months without the patient being especially disturbed. Unfortunately the hallucinations became more intense, more frequent and began to show a change in character. Instead of being pleasant, the faces became ugly, repulsive and soon threatening. The patient commenced to fear them. Gradually she developed such an intense fear that she would scream every time the faces would appear at the window. Soon she would see them in her room, on her bed, under the bed. At each appearance of the faces she trembled, screamed and cried for help. In discussing the condition the patient, at first rejected the idea of reality, but soon began to reflect on the subject, and insisted on the possibility of some cause or reason for the hallucinations. She finally reached the conclusion that perhaps somebody must be inimical to her and persecutes her by sending those visions for the purpose of frightening her. Later on she said, that while formerly she did not believe in

visions, now she firmly believes in them because they are so real. Step by step the patient developed delusive ideas of persecutory nature which became intensified by the hallucinatory images. She became restless, began to accuse her relatives of conspiracy, believed her husband wished to get rid of her so that he could marry another woman. Once she attempted suicide by turning on the gas. At another time during the hallucinatory display she imagined that her sister came to torture her, she threw a knife with intentions to kill. Having become unmanageable she was committed to an asylum. There she showed evidences of paranoia.

CASE 2.—Middle-aged woman after having nursed several of her children for various infectious diseases began to complain of exhaustion. Soon she developed auditory hallucinations. She heard people calling her bad names through the windows. She often joked about them and ridiculed the possibility of such an occurrence. The condition lasted about two months. Not getting any relief from it and the state of exhaustion still persisting, she commenced to worry. With the appearance of depression the hallucinations became more intense and more frequent. She commenced to analyze the hallucinations and to question their meaning. She gradually developed the delusive idea with reference to herself as being to blame for the situation. She must have committed a wrong act for which she is to suffer. Insomnia, marked depression and the desire to die were the other symptoms which soon made their appearance. Presently the patient, confined to an institution for the last two years, presents the typical picture of involution melancholia.

CASE 3.—Middle-aged woman, like the preceding patient developed identical hallucinations which for a period of six months remained of obsessive nature. Gradually delusive ideas made their appearance which were also of the same character as in the preceding case. The patient committed suicide eighteen months later.

CASE 4.—Young woman of twenty-eight with a neuropathic personal and family histories suffered for a period of fourteen months from visual hallucinations of obsessive nature. Faces of men, pictures painted in red would appear before her at first only at night, but later also during the day, but only when she was alone. While they were merely annoying at the beginning, they disturbed her later. Some emotional shocks occurred to her at that time; she lost her parents within one week following an accident in an automobile, her youngest brother, of whom she was particularly fond, contracted diphtheria. The hallucinations became more intense and appeared more frequently. From pleasant they turned out to be disagreeable, and even threatening. She commenced to fear them, to have a horror in anticipation of them. She then abandoned herself to analysis of the hallucinations. Her actions became very peculiar. At times she would remain seated motionless in one position for hours, and talk to herself. She would get up at night and wander through the house as if in search for some one. She never asked for food. She gradually lost her affection for her people and became totally indifferent. Soon she commenced to be suspicious with regard to persons and to her food. She

often refused to eat and when insisted on, she would make the person who brought the food to her to taste it before she ate it. She was found once with a knife in her hands. She is now in an institution presenting the picture of dementia præcox.

CASE 5.—A woman of sixty-five with a history of alcoholism twenty years prior to the present date, otherwise in good physical and mental health developed after a loss of three children, visual hallucinations of a special type. When in bed she would see a crowd of very small persons coming closer and closer to her bed. The size of those hallucinatory individuals would be at times extremely small; they were "Lilliputians." She saw them crowding the room more and more and she often wondered how they all could be placed. New ones kept coming in the room as long as the vision lasted. Sometimes they would dance before her or else get on her bed or under her blankets; then she felt the warmth of their bodies. Not infrequently she laughed before me reciting to me the fanciful manner of acting of these Lilliputians. Soon she began to view the hallucinatory images in a serious manner. She no more questioned the unreality of the condition, but accepted it as inevitable and as having a distinct meaning. The Lilliputians are sent to her for a purpose: "they are perhaps sent to her by her dead children," or else "by some inimical persons." She thought that her brother now knowing that she had no more children to leave her fortune to, wishes to get rid of her and thus sends spirits to carry her away. She soon felt that everybody is working against her, that they are wasting and spending her money. She would close her doors, windows tightly and pull down her blinds. The hallucinations became very persistent. Thinking that if she had children nobody could expect to inherit her money, she conceived the idea of divorcing her aged husband and marrying a very young man. She is now confined to an institution presenting the picture of dementia.

CASE 6.—Young man of thirty-two, banker, had from five to seven years of age, epileptic seizures. No other abnormality or morbid condition could be observed until the age of twenty-seven when he commenced to complain of sudden appearance before him of animals, or disagreeable faces of women. The condition was not continuous but transitory. It was not accompanied by any disturbance of consciousness and lasted about half-an-hour each time. He would see them at first only when he was alone in the room, but later on they would appear at any time. However, the condition did not interfere much with his work, only rarely would he miss his regular office hours. The patient realized that the vision was unreal and he often spoke of them in a jesting manner. A year later a radical change was observed in the patient. He became morose, self-concentrated, restless. For days he would leave his home and disappear, then turn up in his office. His humor was exceedingly changeable. Disagreeable, he would suddenly become gay. The former hallucinations became to him a reality. He commenced to interpret them. He thought that those women tortured him intentionally because the two women whom he had refused to marry are taking revenge on him and are sending the animals

and ugly women to annoy him and "thus destroy his vitality." This delusion became more and more marked and the patient was finally taken to an institution. He is suffering from dementia præcox.

CASE 7.—Man of forty-three had during the last twelve years a number of attacks of obsessive hallucinations of auditory nature. They would come on at irregular intervals episodically. Each attack lasted two or three months. During that time no other abnormal phenomenon was observed and the man attended to his occupation of printer in a perfect manner. He appreciated the absurdity of the voices and considered them unreal. All he heard was: "drown him, take him, he is a villain." The last attack followed an unusual application to his work accompanied by considerable worry over his marital relations. The hallucinations lasted longer than usual, viz., six months and he was unable to do his work steadily. He was compelled to rest several days in the week. As the hallucinations became more persistent, he began to analyze the situation and gradually found various explanations for their presence. He soon became delusive and developed the idea that "someone is back of all this." He concentrated his thoughts on his fellow workers who "tried to get rid of him because they were jealous of his great success." He singled out especially two persons, and rapidly found their associates among his relatives who helped them to ruin him. He became dangerous and was sent to an asylum. The man is suffering from paranoia.

CASE 8.—Brother of the last patient, young man of twenty-one, stenographer by occupation, passed through high school with honors. When he wished to prepare himself for West Point, he found it very difficult and even impossible. He could not concentrate his thoughts. He was obliged to take up stenography. He held the position for three years and did his work very satisfactorily. Within the last year he complained on a number of occasions of hearing disagreeable voices, telling him he will never succeed and that he will end his life in an asylum like his brother. He struggled against these thoughts, fully believing that the voices were absurd and unreal. As they became more and more persistent, he began to feel annoyed by them, neglected his work and at times intended to leave his parents. Gradually he entered the phase of self-analysis and called on me frequently for explanations of the significance of the voice. Not being satisfied with my replies he abandoned himself to his own contemplations and resolved that "someone must be the cause of this." His thoughts worked in the direction of his stepmother whom he commenced to accuse of persecuting him. At the same time the hallucinations became more intense. He began to lose sleep and would not eat. He ran away from home a number of times, was found wandering aimlessly in the country. He was then committed to an institution suffering from dementia paranoides.

An analysis of the last cases show that all patients presented at first hallucinations and later developed delusions. The point of departure of the delusive ideas was the hallucinations. The

character of the latter was distinctly obsessive. We have therefore examples of transition of obsessions into delusions. For a time these patients realized the absurdity of the condition, because their reasoning power was preserved in spite of the fact that they were conscious of the want of harmony between the will and the inability to remedy the condition. We observe that the delusional turn of the mind dates from the time that the patients commenced to analyze the obsessive hallucinations. They then lose all power of critical judgment, become passive, cease to struggle against the overwhelming obsessions. Their consciousness, which helped them before to struggle, becomes absorbed and they accept then the condition, find complete justification for it and ascribe it to some tangible cause. A genuine delusion is then formed.

Transition of obsessions to delusions while not very frequent is not at all a rare phenomenon. This possibility was pointed out, first by Schüle and especially by Séglas in 1889. (*Annales Médico-Psychologiques*.) In 1904 I reported two such cases in *Medical News*. In the present series of cases we observe that the source of origin of the delusive ideas lies in the hallucinatory images. Otherwise speaking the new faulty ideas are a continuation or a natural consequence of the obsessive thoughts intimately associated with the hallucinations. As long as the patient did not interpret the obsession, the latter remained as an obsession. The moment analysis or interpretation commences, a delusive turn of the mind makes its appearance. In this connection it is interesting to observe that the onset of delusional interpretation coincides in almost every one of my cases with some disturbance in the emotional sphere, such as shock from death, diseases among the relatives or some exhaustive state of health. At that time, it seems a break or a complete dissociation of consciousness takes place; the latter has no more control over the psychic processes. In individuals affected with obsessions consciousness is always disturbed but only in a primitive stage or in rudimentary proportions. As soon as a complete split-up occurs, delusive interpretations easily develop.

Let us now turn our attention to the psycho-physiology of the hallucinations as observed in the three series of my cases.

As it is well known some authors believe that hallucinatory perceptions are due to a peripheral irritation of the sensory organs.

I am unable to corroborate this view as there is not an indication in this respect in any of my cases.

As in elaboration of a hallucination there are always two elements, viz., intellectual and sensory, some authors introduced a so-called psycho-sensory doctrine of hallucinations. Baillarger first and Tamburini (*Revue Scientifique*, 1887) next consider a hallucination as due to an irritation of the psycho-sensory centers in the cortex. The latter believes that the phenomenon consists of a spontaneous setting free of energies stored up in the psycho-sensory centers. Tanzi (*Riv. di Patol. Nerv. e Ment.*, vol. 6) accepting the psycho-sensory doctrine attempts to be more concise in his conceptions by believing that hallucinations originate in the association centers of Flechsig. To him the image starts in those centers, ascends to the psychic area and descends to the same sensory centers; thus a new form of sensation occurs which is mistaken for reality; hence a hallucination. Tanzi bases his claim for a descending centrifugal course of a sensation, which is contrary to the classical conception of the function of sensory pathways, upon the actual existence of descending fibers in the sensory centers. If we admit that the sensory centers play a rôle in the production of hallucinations, we can do it only by supposing that several sensory elements are at work simultaneously. Ocular, auditory or other sensations are very complex phenomena and if any one special sensation in a given case may play a predominant rôle, nevertheless representations from several centers are invariably associated with it. This association takes place in Flechsig's association center mentioned above. According to the psycho-sensory theory the hallucination apparently originates along the sensory pathway which as well may be at the periphery. Here again this view cannot explain all the facts observed.

Applying this doctrine to my cases with relation to the obsessive character of the hallucinations, we encounter the same difficulty as in the purely sensory theory. It cannot therefore be accepted as definite. We are naturally led to a third view according to which a hallucination is considered purely a psychic phenomenon. Esquirol (*Des Maladies Mentales*, 1838) long ago said that sensations in hallucinations are but ideas reproduced by memory. He therefore intimates the reproduction of thoughts and ideas accumulated through experience but already forgotten by the con-

scious ego. Baillarger (see above) also sees in the hallucinatory phenomena old stored up energies which in some way gained a spontaneous outlet. Herein lies, I believe, the foundation for the new interpretation of subconscious phenomena upon which Freud's analytic method is based. As it is well known, according to the new doctrine, the subconscious world of an individual is composed of experiences, thoughts, wishes, ideas, sensations. They are never inert but sometimes extraordinarily so active. They are split off from the conscious ego, but exist alongside the latter. Every individual thus presents a doubling of consciousness. The conscious psychic ego spends its activity on continuous creation of new thoughts or wishes and of their realization or fulfilment and thus finds contentment and satisfaction in life. The subconscious ego is entirely under the domination of those latent past experiences in the intellectual and sensory spheres, which could conveniently be called "complexes" and which have never disappeared but are only repressed. Should they by some psychological process reach the conscious ego, they may assert themselves as fanciful picture formations, viz., hallucination. On this basis the hallucinations of the three varieties of the hallucinatory phenomena in my three series of cases find their explanations. In the obsessive hallucinations of the first series we find that the phenomena were nothing more than a reproduction of the more or less remote events that had actually occurred in the lives of the individuals. While in some cases the reproductions were exact, such as in the case of the mother who saw the face of the child that died some time ago; in other cases the hallucinatory phenomena appeared as occurrences somewhat modified from the original. In some cases we observe complete substitutions which apparently have no resemblance to the former events, but a close analysis will invariably reveal the past experiences in toto: their appearance alone had changed but not the quintessence.

The relationship between hallucinatory images and obsessive ideas as seen in the series of cases in the hallucinatory obsessions is too obvious and too evident to dwell upon. Here the hallucination is but an exteriorization of the predominant conscious thought of the obsessed individual.

Quite interesting from the pathogenetic standpoint is the fact that the obsessive thoughts and the substituting or accompanying

hallucinations in all my patients developed invariably under the influence of some moral or intellectual disturbance. It seems as if the past experiences which actually occurred and remained dormant became displaced or aroused through the unexpected or sudden shocks and thus given an impetus for self-reproduction. It is indeed remarkable to notice the uniformity with which the hallucinatory phenomena in my cases proved to be in a direct relationship to events that actually occurred in the lives of my patients. The conception of sub-conscious complexes has been indeed very helpful to me for the understanding of the obsessions and hallucinations in connection with obsessions.

From the foregoing remarks, one will observe that the above-mentioned sensory and psycho-sensory theories of hallucinations are by far less satisfactory for the understanding that the psychological doctrine, the origin of which we find in Esquirol's view (see above). This author only intimated the existence of hidden psychic processes but to Bleuler and especially to Freud we owe the further detailed elaboration of the mechanism which controls the mental operations in normal and pathological life. The psychic theory alone is apparently able to give a clear insight into the processes connected with formation of morbid ideas, such as obsessions and hallucinations.

The clinical side of the present study permits me to draw this conclusion that hallucinations may exist either as independent phenomena possessing all the characteristics common to obsessions (obsessive hallucination), or else as phenomena accompanying or following obsessive ideas and thus constituting a symptom of the entire psychasthenic syndrome.

Janet in his work "*Obsessions et Psychasthénie*" does not consider the hallucinations of psychasthenics as genuine hallucinations. According to him they are lacking in completeness and thorough exteriorization: the patient, he says, rather thinks than he sees or hears, but he is not totally sure. Janet considers them as "pseudohallucinations." In my cases of the second group Janet's contention is only partly corroborated; while in some of the cases the pseudo character of the hallucinations was evident, in others true, genuine hallucinations were also in existence. It seems therefore that his contention is somewhat extreme.

Among other features of the hallucinations, my cases show that the following functions were involved: visual, auditory, olfactory, tactile, verbal and graphic. Their relations to the great association center of Flechsig and the rôle played by the latter was mentioned above.

A third interesting observation is that every patient of all three groups presented a history of marked pathological emotivity, viz., affectivity. Bleuler included into the latter term feeling, mood and emotion of all degrees. He also very aptly says that thought and action are the resultant or symptoms of affectivity. How obsessive ideas or obsessive hallucinations will develop in individuals with a pathological affectivity can be readily explained if we accept the conception of "complexes" so thoroughly worked out by Bleuler, Freud and Jung. I mentioned above the failure of the sensory and the psycho-sensory doctrines to explain the manifestations observed in my cases.

Finally, the last important feature of my study is the transformation of obsessive ideas into delusions. The latter developed from all the elements of the obsessions or of the obsessive hallucinations. Such transformation occurs when the obsessions are old and intense, when the controlling power of the conscious ego is weakened. We then see the obsessive thought becomes incorporated into the personality and is consequently no more conscious. The conscious idea becomes unconscious, viz., delusional.

It will be also observed that the obsessions in these cases are in the form of hallucinations. Whether such a variety of obsessions render the transition into delusions more certain, it is difficult to say, although such was the case in every one of my eight cases. In my former contribution to the subject (see above) hallucinations were absent.



THE ASSOCIATION TEST AS AN AID IN DIAGNOSIS.*

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The mental examination of a patient is at all times a serious matter. Usually a great deal depends upon its result, sometimes the breaking up of a home, at others the temporary banishment of one of its members or some other more or less serious change. For this reason it must be taken up very carefully and on account of the numerous points which must be investigated it is apt to be much more prolonged than the ordinary physical examination. Usually we cannot expect to accomplish very much in less than an hour and it is often necessary to go beyond this. In such cases it may be better to divide our examination in order to lessen the strain upon the patient. It may be, however, that this is impossible and what is most likely, our own time is limited and we are forced to do the best we can with what we have at our disposal. Any procedure which will shorten the time of the examination and give us a maximum of information with a minimum of effort is welcomed by all of us. The association test as elaborated by Jung seems to me to be a most valuable adjunct to psychoanalysis. Yet even this consumes time and when we are examining a dispensary patient with the knowledge that we must see three or four more in the hour at our disposal, we are tempted to let this test remain until another time. In fact, under such unfavorable circumstances some one is bound to be slighted.

Then, too, in our hospitals for insane, with a large number of cases to be cared for by a small staff, it not infrequently happens that a physician is swamped by an influx of new cases, the examination of whom he feels must be made promptly, even though superficially.

Recognizing the value of the association test, I began to experiment several years ago with the idea of determining if the test could be abridged and yet remain of value. At the outset it was evident that the knowledge of the patient's content of conscious-

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

ness, which the test is designed primarily to bring out, would be diminished proportionately with its length. I feel that my results have been interesting and while narrating them would like to call your attention to a few points of general interest concerning the association test. The technique of its application is practically the same. It usually requires two besides the subject, one to record, the other to observe, and personally I usually have a stenographer to record while I manipulate the stop watch and call out the words. In my abridged test I have used but ten or twenty-five words from lists which were formulated by Dr. Farrar, Dr. Meyer, Drs. Kent and Rosanoff, and one or two others. In a considerable number of these experiments no attempt has been made to interpolate significant words, which can very easily be done if we have some knowledge of the patient's history. At other times, when I have not had one of these lists with me, I have chosen words at random to separate a few significant words. Naturally by the use of such a limited number we diminish the probability of presenting significant words; that is, words which cause a delay in reaction time by reason of stirring up some complex in the patient's consciousness.

In certain cases, where I have made a special list of words and have interpolated significant words in it, it has been possible to discover complexes with a number even less than twenty-five, but this at times has merely served to prove the history rather than discover anything unknown. My reason for not interpolating significant words more frequently is that I was desirous of subjecting the test to as severe a trial as possible, but naturally the value of this brief form of test is enhanced by so doing, just as its value is probably greater when there is a repetition of the test. This I usually omitted, as a ten-word test is too short to bear an immediate repetition and I was also desirous of estimating the value of the test without it.

The normal reaction time of two seconds, or ten-fifths, was adopted as a standard and it did not take me long to conclude that in this brief test the reaction time is probably the most important results of the test; that it teaches us more than anything else, and this has been rather interestingly confirmed by two students of Vassar, one of whom, Miss Washburn, tried to discover in the record of each experiment without looking at the

reaction time which of two objects had been seen by the subject. Out of fifty-two results, she was correct in thirty-four, incorrect in sixteen, and it was impossible to determine in two. She says: "Evidently reaction time alone is a much safer guide than the character of the association alone."¹

Taking into consideration reaction time alone I feel that the test is a very valuable one, but it must be remembered that while we are getting this we are learning much more about the patient. We observe the emotional reaction and his manner of thinking as well as other things which are very difficult to record, but which give us an impression of the case which we immediately seek to prove or disprove by further investigation.

I think that the following case abstract may make the above quite clear.

CASE I.—A young woman, school teacher, aged 28, single, was admitted to the Sheppard and Enoch Pratt Hospital October 1, 1910. Her father had died January 17, 1910, and the patient continued to live with her step-mother and the latter's children, with whom she was somewhat incompatible. In April they went away leaving her alone until August, when her brother joined her. He found that she did not sleep well. September 5 she resumed her school work until the 19th, when insomnia returned with depression. She stopped teaching after a few days. Suicidal ideas were present. With this meagre history the impression made by the patient was that she was a case of depression and this was the consensus of opinion at conference, October 31.

An association test made October 7, 1910, was as follows:

Word.	Time.	Reply.
1. Head	34	My head
2. Green	8	Tree
3. Water	12	(Not understood)
4. To prick	7	What? To prick?
5. Angel	9	Dead
6. Long	54	Can't think of anything
7. Ship	10	On the water
8. To plough	5	Field
9. Wool	6	Dress
10. Friendly	12	People
11. Table	12	To eat
12. To carry	15	Burdens
13. Insolent	18	Boy

¹ Some Tests by the Association Reaction Method, Hazel M. Leach and M. F. Washburn. *American Journal of Psychology*, V. XXI, p. 162, 1910.

Word.	Time.	Reply.
14. To dance	12	Pleasure
15. Lake	5	Water
16. Sick	14	People
17. Proud	10	Woman
18. To boil	8	Water
19. Ink	8	Black
20. Angry	8	Clouds (A gray day)
21. Needle	7	To stick
22. To swim	6	Fish
23. Journey	7	The ocean
24. Blue	5	Sky
25. Bread	8	Flour

While the probable mean reaction time is 8, or below normal, it will be noted that there are a number which are prolonged. In this experiment words 3 and 4 must be discarded from our consideration. As to 1, it is not uncommon to find a delay on the first few words given. Words 13 and 17 were believed to have some unpleasant significance, but no attempt was made to bring it out. The reply to 21 was believed to have been suggested by 4, possibly showing perseveration. That to 5 was probably due to her father's death. The remaining replies are normal. Replies 10, 11, 12, 14, 16 are normal except for a slightly prolonged time. The reply to 6 was the most important thing elicited in the examination, and led to further questioning, from which the opinion was gained that the case was probably one of dementia præcox. Later observation served to confirm this, and the patient was transferred to a state hospital, where she now is.

Recently I was called to a general hospital to see a case in consultation. A young woman of 26 had about ten days before met a young man who had previously been employed by her father and been discharged for insolence to her mother. She had not seen him for two years. An engagement to marry was immediately made. That night she went to a Crittenton Mission Home and the following morning sent word to her relatives and affianced where she was. Doing this to prove the latter's love. Her history in the hospital gave the impression that she was suffering from acute mania and my questioning seemed to confirm this, but a brief association showed a prolonged reaction time and a poor quality of replies, so that a rather guarded opinion was given. It being believed that the patient might be suffering from dementia præcox, subsequent observation has confirmed this.

Briefly stated, I believe that this abridged association test may indicate mental defect as shown by the feeble-minded or by pre-

cocious dements more quickly than by any other means of examination.

I was greatly interested in a series of these tests which I made upon nurses with the idea of getting controls. All of them were young women whom I had known for some time and I was greatly surprised to find how their general reaction to the test was so exactly according to their personal characteristics.

I do not wish to leave you with the impression that I regard this test as more than an aid in diagnosis, but I do regard it as being most suggestive of the patient's condition. Mental retardation may be the result of so many conditions, that alone it does not mean a great deal, but the character of the patients' answers and the emotional reaction are most important.

I feel sure that a brief trial of this test will prove to you its value.



THE FATHER COMPLEX.*

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When the first cases of the so-called Oedipus or Father Complex were published, the subject seemed very startling and aroused considerable scepticism in the mind of the reader. On studying cases more carefully, however, from an unbiased standpoint, the conviction was gradually forced upon the observer that such a complex did exist; that the development of the abnormal mental condition in the cases presenting this picture dated back to early childhood and went hand in hand with the general development of the individual, was, therefore, distinctly fundamental.

In the analysis of the cases, care was taken not to suggest anything that might influence their answers, as it was felt that in all the suggestibility was considerable. The facts presented are spontaneous statements on the part of the patients obtained by the process of association.

The first five cases of the series would seem to be of the Oedipus type. The last three are contrast cases. Case VI, while subjected to similar damaging emotional influences during childhood, shows an entirely different reaction type, possibly because the makeup is different. Case VII, as does also Case VIII, shows an emotional disturbance as an episode in the life history of the individual, and, because of this episodic instead of fundamental character, of better prognostic import. This in spite of the fact that there are poor hereditary factors in both cases.

CASE I.—J. R., æt. 35, born in Germany, wife of a laborer. *Temperate according to husband. Patient states, however, that at five years of age she was profoundly intoxicated after drinking a large quantity of brandy which she was bringing home. Since reaching adult life has always drank some beer but no whiskey until the past year. Since then while working hard, doing extra laundry work, she has taken a drink of whiskey repeatedly during the day. Cannot state exactly how much she has taken.*

* Read in abstract at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

Family History.—Little information obtainable from husband and niece. The only sister of patient is of small physique and very nervous; otherwise the family history is negative. Her only brother died from exposure to cold.

Personal History.—Nothing known of childhood or early life. Married at 19. She has had two children, fifteen and nine years old, respectively. According to husband she lived a normal, happy married life.

Onset of Psychosis.—Husband states that attack came on gradually without known cause a year ago, but niece, who is about thirty years old, states that patient has been "queer" as long as she can remember. When told anything would interpret it with a wrong meaning and then become irritable and scold. Always complained of neighbors persecuting her; if they laughed she thought it was at her expense. Thought the same of strangers walking along the street. Would become disturbed and complain whenever neighbors wore new clothing, hats, etc. Thought they wore these to make her uncomfortable. Always was suspicious, frequently visited fortune tellers and gave their ideas credence. *She was not considered insane, however, until about a year ago.* At this time she went to look at three new pipes which had been placed in the church of which her husband was sexton. She claimed that she saw six pipes instead of three. When told that there were only three, she was very much startled and could never be induced to enter the church again. Shortly after this she became agitated every few days for periods of one and one-half to two hours when she would punish her children unnecessarily, quarrel with neighbors, and throw things about the house. Complained that neighbors were constantly insulting her and were going to do her harm. During lucid intervals apologized to neighbors so that they became quite tolerant of her outbreaks which were gradually increasing in frequency. In January, 1912, she had two gynecological operations. Upon her return from the Hospital she stated that they had tried to kill and butcher her. She then became what the niece calls "religious struck." Would pray for several hours every day. Discharged the servant and quarrelled with sister-in-law who had come to help her. Would not allow niece in the house, saying that she feared she was to be bewitched. A few weeks before commitment thought neighbors were trying to burn the house. Punished the children so severely that husband feared she would kill them. Appeared to have hallucinations of sight and hearing; carried on stormy conversations with neighbors who were not present. Heard rapping at doors and crowing of roosters which frightened her. Also probably had hallucinations of smell. Claimed that she had known of deaths which she heard or read about, by a peculiar odor which she had experienced. Developed a peculiar laugh. Complained that she couldn't get her house clean and would show imaginary dirt. Refused to drink coffee, believing that it contained poison. She was brought to the hospital because the neighbors feared that she might do violence to them.

On admission, September 9, 1912, she is pleasant and affable; cooperative. Volunteers little but answers questions fully and at considerable length—rather diffusely at times. Asks us to send her home to her children as there was no reason for sending her here. Weeps when speaking of her children but as a rule only momentarily.

She is coherent and uses no unusual expressions, but there is at times considerable confusion of thought. Is fully controlled by delusions of persecution on the part of her neighbors which she considers entirely unwarranted as she herself has always tried to do right. Through the influence of these people, especially a Mr. N., everything is changed, seems unreal. Husband appears unreal and it seems as if she were continually living with different men. Feels herself constantly influenced and interfered with in her actions by these people. Starts to do things in a certain way and suddenly has to do them the opposite way. Is afraid to take a bath because she imagines that men are watching her. Her mental condition appears analogous to a waking dream state in which she sees her whole life come before her in a series of pictures which she describes very vividly. Also sees strange things—people among the leaves of trees, among the laundry on clothes lines, etc.—which is brought about through the influence of her neighbors. Some of these things amuse her; others distress and confuse her.

She gives the following account of her life and development of her trouble:

Up to twelve years of age her life was an easy and comfortable one as her father was fairly well to do. At this time, the father was sent to prison for having insulted the teacher and according to patient was accused unjustly of misleading children. After that they were very poor, she had to beg her bread and had to work very hard—never had any luck from this time on. She was the favorite of her father and until he went to prison, i. e., until she was twelve years of age, she and her sister slept with him during alternate weeks. She denies incestuous relations but during this time she had frequent anxiety dreams when she felt herself suspended in midair. At five years of age she had her first hallucination of sight. Saw her father standing beside her bed in his undergarments, looking intently down at her, his right hand raised to Heaven. She knows that she was awake at the time and that her father was absent from home.

At thirteen she went away from home to work on a farm of Major V. Kotten near Stettin. During the first year had to work very hard and was treated harshly by the overseer. During the next two years, after injuring her hand, the major and the new overseer, a Mr. Brown, treated her with unusual kindness, made her work very easy and singled her out generally from the other servants. Both the major and Mr. Brown resembled her father and in her mind they are a composite picture of her father. As she (patient) has the same high brow as her father and the major, she thinks she must be the major's daughter especially as she heard it said that her father's name was engraved on a silver cup in Berlin and because her father always wore a high hat and kid gloves.

Sometimes she has thought that the major was really Emperor William II on account of the major's receiving a letter from the emperor which she believes to have been the one she wrote to the latter asking for her father's pardon. She therefore thinks that she may be the daughter of the emperor. Since coming here, she has noticed that Dr. H. resembles her family physician in Tonawanda; that they both have brown eyes like her father and that they must be relatives of hers; has THOUGHT THAT IT MAY BE A CASE OF RESSURRECTION AND THAT HER FATHER MAY HAVE COME TO LIFE AGAIN. She states that her father died before she left Germany and that she was afraid to touch his body when her mother asked her to help her with it.

At eighteen she came to this country; went from New York directly to Tonawanda and worked as a domestic until her marriage at nineteen. Was not very successful, people treated her badly and she changed places frequently. While staying temporarily with distant relatives, named N, the husband, i. e., Mr. N, *assaulted her sexually*. She worried considerably about this and thought of suicide. *Married her husband at nineteen after a short acquaintance, not so much because she loved him but because he resembled her father, having like him a crooked nose.* Against her wish she had sexual relations with husband before marriage, and has never been happy with him as he didn't seem to care much for her and she thinks he was not true to her although he provided well for her and the children. She always tried to do her duty toward him.

Nine years ago they moved into their present home, and ever since then she has had considerable trouble with the neighbors. They have tried to annoy her in various ways, are an uncleanly and careless class generally and she has felt that they had a corrupting influence on her children, but there was no acute trouble until her return home from the hospital in January.

Since the hallucination of seeing her father, when five years of age, she had had, until the present outbreak, an occasional hallucination. Seven years ago saw husband standing in the doorway while she was coming from the woodshed. Remembers distinctly that he was away from home at the time. Four years ago she saw standing in front of her door, two little girls who suddenly changed into one grown-up woman in a phantastic dress, resembling somewhat her neighbor, Mrs. H. This sudden change frightened her and she didn't get over it for some time. Several times while working in the church she has heard footsteps overhead and behind the piano, and on looking for the person found no one there.

Since her return from the hospital, in January, everything has seemed changed—things undergo rapid transformation before her eyes. Her husband looks different at various times so that she is afraid to be with him, fearing that she is really living an immoral life with many men. She feels herself continually interfered with in her actions so that she doesn't know what to do. Feels that she is constantly being watched and that something is going to happen to her. Believes that all this change has been brought about by Mr. N., who seduced her before her marriage and who has made fun of her and accused her of being an immoral woman.

She describes the following visions which she had in the waking state before coming here:

Seven weeks ago saw the daughter of Mrs. H (her neighbor) hang out the laundry. Suddenly, while looking at it, she saw suspended among it, Christ on the cross and on each side the crucified thieves.

Another day saw this same woman stand beside a *corpse*, covered with a sheet. The woman was crying and the coffin was surrounded by a number of men in high hats who made speeches. *It seemed to her that the corpse was her father's body.*

More recently (also in the waking state), she thought she was in a cemetery; somebody looked over the fence to see whether a body had been brought there. She cannot describe the appearance of the person who looked over the fence.

Another day *it seemed to her as if a corpse had been found in Germany* in the place where her father, and she (when a child) had eaten their lunch. *It seemed to her as if her father had been accused of having killed somebody*, and as if the daughter of Mrs. H. had been in that place during her recent visit in Germany.

She states that she *never heard actual voices but heard sounds* as if someone were going through the rooms in a silk gown. Has several times *smelled the odor of a corpse* which was a premonition that someone was going to die. *Smelled odor of musk* in her clothing.

In addition to the dreams in the waking state, *she had a number of vivid dreams while asleep.*

Dreamed that Mrs. N. (the wife of the man who seduced her) *lay dead in a casket in her (patient's) room.*

On the ward she *describes the following scenes which are vividly enacted before her on the wall, door and window.* Narrows her eyes to distinguish them better and often laughs, when she sees something that amuses her. *She sees them only with the EYES OPEN.* Sees birch trees which she remembers as being near her old home. Sees a table at which a woman is seated. Four other women in white and without hats are seated on the bank. A man seated near, is talking to them. Among the women in white there is an old woman who seems ill. A man with a perruque, like an old noble who may be George Washington, looks on. Then there is a picture of a young girl who is bringing a cup on a tray similar to that on Baker's chocolate. There are some ladies in crinolines who are getting out of a carriage and are talking to the gentlemen. Among the women in white she sees a baby carriage. The old woman who seemed ill, appears to be holding someone. A man kneels before her; the old woman stands up and looks down at him. A woman with parted hair seems to hold a child; *this woman seems to change into a man.* There are flowers and trees which seem to contain people. A soldier in white trousers seems to change into a baker, then into a butcher or a butler. The woman who comes out of the carriage seems to carry a child and is received by another lady. There are trees on one side, *a casket covered with flowers on the other. The casket disappears and is REPLACED BY A YOUNG*

WOMAN AND A YOUNG MAN WHO SEEM TO BE IN A BOAT. An older man seems to talk to an older woman dressed in black, wearing a cap, etc.

As she herself explains, "what she sees is a mixture of what she has seen in real life and what she has seen in pictures." It is a veritable automatism of thought.

The further course showed variable conduct, at times tractable and interested in her surroundings, again unreasonable, complaining that people influence her; noisily demands her release as she is not insane. In course of further analysis stated that she had for years been in fear of Mr. N. That he had repeatedly come to her home and made improper proposals to her and that she felt that he had a strong influence over her.

While at the homeopathic hospital, he had visited her with his third wife. Kissed her hand which she thought entirely uncalled for. She continues to have vivid hallucinations of sight; while describing them she narrows her eyes in order to distinguish them better. Continues to believe in the persecution on the part of neighbors; thinks it terrible that she should have to suffer for their wickedness. Has transferred her delusions to some extent to the hospital. Said that people were constantly talking about her and making reference to their own affairs thus trying to make a soothsayer or fortune teller of her. Heard them say that she was going to die of cancer like her mother. She repeatedly expressed the belief that people read her thoughts. On one occasion stated that for some weeks previous to her going to the hospital she couldn't sleep, felt that something terrible was going to happen to her. One night felt a storm sweeping through her room, saw clouds rushing past her. Thought that she was to be punished for having emptied urine into the sink at home and in the church. Thought God had forsaken her for it. Prayed to be forgiven and opened door wide so that God might enter again.

Physically she showed nothing beyond a cystic goitre and slight anæmia.

Turning now from the manifest to the latent content of the psychosis as obtained by psychoanalysis, we find two trends towards which all her ideas seem to converge—the main trend—the father complex—and a minor trend which might be called the N complex.

For the main trend, the father complex, we have the following:

(a) The anxiety dreams in childhood produced by the faulty moral and mental hygiene—sleeping with the father until twelve years of age.

(b) Marrying her husband not because she loved him, but because he resembled her father, and a persistent disharmony between herself and husband.

(c) The identification of various people with her father and the exaltation of the father's personality and through this to some extent of her own. The feeling that Major V. Kotten for whom she worked as a girl resembled her father; that she might be his daughter or even the daughter of the German emperor because the major received a letter from the

emperor which she believed to be the one she had written to the latter asking for her father's pardon. Identification of her family physician and of Dr. H with her father because like him they have brown eyes.

(d) The men who most frequently seem to assume the guise of her husband are a Mr. R, a man with a crooked nose (like her father), and a dentist in whose office five years ago she picked up a skull, which it occurred to her might have been that of her father.

(e) The recurrence of dreams in which the casket and a corpse figure prominently, the corpse frequently resembling the father, e. g., the day dream of a flower-covered casket among the trees, the casket disappearing and being replaced by a young man and a young woman in a boat (the father and daughter?). The vision of a neighbor's daughter (who had recently visited patient's birthplace in Germany) standing beside a coffin which seemed to contain the body of patient's father. Again dreamed that last summer a corpse had been found in the place where she and her father had eaten lunch together—the frequent odor of a cadaver.

(f) The frequent smelling of musk which is found to be associated with yellow flowers that she saw in the garden of a Mr. W, a friend of her father's whom she visited one day when a child, in company with the father.

(g) Fear of touching father's body after his death.

(h) Finally the evident identification with the mother in that she hears voices in which she is told that she is going to die of cancer, the same disease that caused her mother's death.

For the N trend we have the following:

(a) The fear of him; and if we consider fear as an inverted wish we will recognize at least a certain attraction towards him which is evidently greater than her attraction towards her husband. We know from her statements that she has had from time to time relations with this man for which she disclaims responsibility but attributes it to his influence over her which she cannot resist.

(b) The dream she had of seeing Mrs. N dead, in her, i. e., patient's, room also probably a vague wish realization.

(c) The fright she had over the pipes in church and the hearing of footsteps, etc. Her association of this is as follows: She had heard her husband, who is sexton of the church, say that women came to see him there. While disclaiming any feeling of jealousy, she remained in the dark church for an hour watching, in order to see whether anyone really came to see the husband. She thought she heard footsteps and evidently was disappointed that nothing happened.

This we are probably justified in interpreting as a wish to know her husband unfaithful as in that case she would have something to balance her own indiscretions.

During her eight months stay at the hospital she improved considerably; became gradually more manageable and more amenable to reasoning,

showing generally more self-control, but her underlying delusional trend remained essentially unchanged. Husband considered her so much better that he wished to try her at home and, having removed from the old neighborhood, he was finally allowed to take her early in May. While he reports that she is doing well at home, she will undoubtedly have to return to the hospital sooner or later as the delusional trend is fundamental.

NOTE.—March 2, 1914. Patient was returned to the hospital in July, 1913, thoroughly controlled by her old delusions and continues so at the present time.

CASE II.—Aet. 32, single, daughter of well-to-do American parents.

Family History.—Father very nervous, a hemiplegic at 63. Temperate in habits. One paternal aunt extremely nervous. Mother's people normal. There were three children in the family of whom patient is the youngest. One brother dead; the brother who is living is quite nervous.

Personal History.—Received a good high school education and found study easy. Worked as a stenographer for a short time but had to give it up on account of her nervousness and fear of men. Latterly has done some greenhouse work and gardening. She has been under the care of several physicians for her nervousness and was sent to the writer by one of the neurologists in the city, as he thought that on account of her fear of men, a woman might possibly be able to do more for her. She is a well-developed, intelligent looking woman in excellent nutrition. She seeks relief because she is absolutely unable to hold a position or enjoy the ordinary social relations because she is selfconscious before people on account of her habit of masturbation and because she persistently sees men naked before her. Is in constant fear that she may commit some immoral act.

She gives a *history of a warped emotional life dating back to early childhood, and in which the father complex evidently plays the leading rôle.* Her account of her life is as follows:

As she was the youngest child and very nervous, she slept in the same room with her parents, often in their bed until seven or eight years of age. When seven, she remembers accidentally touching the father's genitalia with her foot and felt an intense disgust from that day. *Menstruation was established at twelve and about this time she developed a horror and fear of her father* which has persisted; couldn't bear to be near him and during his long illness couldn't bear to touch him. At 14 developed the habit of masturbation which she has kept up to the present time. She never felt comfortable in the presence of boys and at 18 she commenced to see the male genitalia before her and also had visions of sexual relations; read a great deal about sexual matters as she had a great curiosity about them. At 19 she went to consult an oculist whom she shortly told of her habit. He assured her that he could cure her by hypnotism which he was in the habit of using to some extent. He hypnotized her two or three times and the second time she found his arm around her; the next time he kissed her. She realized that it was not right to allow him to do this;

felt ashamed and yet could not resist. She was in love with him as she expresses it and went to him two or three times a week for four years. She frequently allowed him to kiss her but never had sexual relations with him. She was always afraid that she might yield in the end; felt thoroughly ashamed of herself but did not have the will power to remain away. After four years she finally did stop going to him but always had a desire to return. She has worked in offices from time to time but never could hold a position, because she would soon become afraid of the men; felt that they must read in her face her sexual thoughts and constantly feared that she might become an immoral woman. At times when overpowered by her nervousness she has felt that she would like to run naked across the park and scream.

In the course of the analysis she expressed a number of phobias for which the explanation was obtained principally through letters as she seemed to be able to associate better in this way than in the presence of examiner. She expressed:

- (a) Fear of dead people.
- (b) Fear of the dark and water.
- (c) Fear of fire and water.
- (d) Fear of ghosts.

She also *had a number of obsessions:*

(a) During interviews she often looked critically at the bricks in the wall as if searching for something.

(b) In the midst of interview would ask to be silent for a minute, whisper to herself, and then go on with the conversation.

(c) She had the habit of taking, when nervous, foolish little steps, as she expresses it, counting fingers and looking for things on the floor, the worst being the looking for things on the floor, which made her most nervous.

(d) Saying certain words, especially, "God—Christ—um," over and over, never being satisfied that she had said them quite right or the correct number of times.

I will give the various associations in patient's own words as obtained from the letters:

(A) *Fear of Dead People.*—Association: After the death of my brother I dreamed of deaders every night for a year and a half. It was always night and usually I was wandering about the cemeteries and falling into open graves. One night I dreamed of someone knocking at the door and when I opened it, there was a dead man thrown at me. Another night I went such a very long way through such dreary places and finally was left alone in a room with a deader. They feel so cold and funny. Just like meat. And if you look at them for a few seconds they move and if you stay in the room a few minutes near them you get such a horror that if you didn't get away something would happen.

(B) *Fear of the Dark and Water.*—Association: If I ever should have to remain in the dark all night alone, I am sure I should be insane in the morning especially if water ran through the pipes even half the time.

Since I grew nervous I dreamed a great deal about water and there was always the idea of fear associated with it. It (the water) was always very dark and sometimes running very swiftly; often it was night and I was at the Falls—sometimes above, sometimes below. I don't believe I ever went over them but I was at the brink pretty often. And I was forever falling in my sleep in those days. And now I am afraid of the water still but more afraid of those little waste pipes that are supposed to carry off the water in case it flowed too fast and overflowed. What is in them? I think it would be an ideal place for all the things I am afraid of. Where do the pipes go? They are an uncanny lot of things. There is something uncanny and terrible about the whole subject to me. There is so much mystery connected with it. Think not only of those comparatively few little pipes in our cellar but of where they lead to and of all the network of pipes that underlies the whole city. Jean Valjean came upon the body of a dead man. I think he bumped against it when he was going through the sewer. And the water, it comes from out there in the lake where it is so terribly deep and where so many people have been drowned. And how dark and horrible it is there at night. The ghosts would have a very good time. That man in prison who took the dead man out of his shroud and carried him into his own dungeon and fastened himself into the shroud and allowed himself to be thrown into the sea at midnight because that was the way they buried prisoners who died and the scream he gave when he struck the water. I am afraid of deaders and ghosts more than of anything else.

(C) *Fear of Fire and Water; is intimately associated with the obsession of "looking for things on the floor."*—Association: The doctor who hypnotized me, wrote me several letters. They have been burnt for years. I knew I didn't have any right to have any letters from him and so they worried me to pieces. And while I did have them I was always afraid I would put them some place where they would be found and be read by someone. And when I was very nervous, I used to spend a good share of my time looking for them even after I had burnt them. I used to see them everywhere; on the sidewalk, on the walls of the church, in the trees and in just any place. That is why I am always *trying to find whole bricks* in the walls of the rooms where you talk to me and to find whole little grains in the woodwork and I'm always looking for whole things all the time. I don't know why it rests me to find whole things but I couldn't stand it if I didn't. Even now I am still looking for those letters. If I am very nervous, they insist upon being picked up. They are always worst at bedtime. And they have mixed themselves up with turning off the water and with being afraid that I have set fire to something. I get almost under the kitchen range and crawl around in other foolish places during these times. Would you expect to find fire at the bottom of a bureau drawer? *Those letters have turned into little points of light.* I see the lights and I've got to look at them and pretty often feel of them and yet in some way it is the letters I'm seeing. The letters came first and then

they switched off to lights and to water. I don't want to set fire to anything and I don't want the water to run over and spoil the plaster.

(D) *The Fear of Ghosts*.—Association: I ran into a ghost last night right outside my door. I know there aren't any ghosts but I see them anyway. There is one that stays downstairs all the time but if I go out into the upper hall he either comes up a little way or twists his body around the edge of the bannister and grins at me and teases and frightens me. I don't look at him but I see him anyway. *Maybe it is the ghost of Dr. X* (who hypnotized her). In fact I'm sure it is. There are arms, not exactly arms, because they are ever so many feet long, that stretch out for me from below.

(E) *Obsession of Repeating Certain Words* especially "God, Christ, um."—Association: When I am very nervous, no question can be answered until certain words, especially God and um, which are the most troublesome, have been said enough times or in such a way as to suit me. And I can seldom stop even when I promised I would say them only once.

There used to be a severe pain in my head; it felt as if everything in my head were drawing towards one point in the center; then I would say things over to myself until I would grow frantic and scream and pound my head on the floor and wall. After that there would come a dull time when I couldn't think of anything and would drone over and over "um." Since then the pain in the head would return whenever I say that word over 8 to 10 times. If the "um" is the name for the pain in my head, it is also the name for my greatest unhappiness (the habit). Some people groan when they are in pain and as there are different groans for different kinds of pain, perhaps my sound expresses mine.

I am often so taken up with *those little things that say themselves* that I can't talk very much and then people think that I am stupid.

Why is it that when I really turn to Him (God) that things are worst of all?

I wish I could really pray but it has been the source of a very great deal of unhappiness. The only way I can pray and keep my nervous balance is by saying words and the worse I feel the more carelessly I have to say them. I can't get along without it at all because such religion as I have is all that has kept me from suicide and from doing wrong. And when I pray really and genuinely and beg and beg for deliverance from my trouble, then everything goes to pieces. And that is how God came to be one of my words that I say so many times over and over. It began by praying so hard for help on Communion Sunday and then I couldn't stop and I pounded my head on things and so God and "um" went together in my mind.

My greatest worries for years have been the habit and religion and my unkindness to my father. The worry about religion was the worst because if that could have been straightened out, then the strength of religion would have enabled me to do what I ought in the other two matters. And besides, if *He is your Father, but has turned away* because you are so bad and cannot be better, you feel pretty badly because He doesn't care.

The point is not, I suppose, whether or not all this is narrow or irreverent. It is only that *these are the* things that I have been thinking about.

(F) *Obsession of Taking a Certain Number of Steps.*—Association: I take the steps because there is something in me that is afraid all the time just of almost anything and everything. It seems to me that if I take those steps enough times just right—only they seldom do get taken just right to suit me—and say the things to myself that I do say at those times, those steps and words will ward off the trouble (habit).

In analyzing the various fears and obsessions we can obviously refer them to three different complexes:

- (a) The leading one, the father complex.
- (b) The X (the oculist) complex.
- (c) The brother complex.

For the *father complex* we have:

- 1. The fear of him, developed at puberty.
- 2. The fear of water (as will be stated below).
- 3. The identification of the earthly and heavenly father with the obsession of saying "God" and "um," plus portions of all the other fears and obsessions.

For the *X complex*: The fear of ghosts.

For the *brother complex*: The fear of dead people.

While she was under observation, it soon became evident that there was present also a *strong homosexual trend*, evidenced by her extravagant language about her attending physician. When she was cautioned not to become too dependent upon her physician, that the aim was to train her to a wholesome, independent condition in life, she wrote as follows: "I don't think that I shall ever get into any such trouble again as I did when I was between 15 and 17. At that time I was for several years deeply and hopelessly in love with my Sunday school teacher. It was while I was caring so strongly for her that I grew self-conscious and began to wonder all the time what people were thinking and saying about me. Before that I was as independent as need be but since then I have always felt that I must have someone to depend upon." Later she confessed that women had exactly as much attraction for her as men, except that she was not afraid of the former.

She also showed what so many of these patients show, and what makes their treatment often so unsatisfactory, namely, *an absence of any real desire to get well*; they are evidently well satisfied with their abnormal mental life in spite of their makebelieve efforts to change it. She had written on several occasions: "I know I am very, very bad; I know what is in me. I THINK myself that I am pretty good but I *know* I am not. I don't half try. I cannot wake myself up and most of the time I don't want to." When during one of the interviews about the middle of the treatment period after considerable analytical and reconstructive work had been done, she calmly told me that she didn't really want to get well and that anyway she didn't know what I really wanted her to do (although her letters showed that she had grasped things very well) I gave her,

figuratively speaking, a severe mental lashing. I told her "that I wanted her to try to live a decent mental life. That it was perfectly disgraceful for her to say that she was satisfied with the kind of mental life she was leading as she had just confessed. That while, as I had said before, she was not responsible for the early development of her trouble, it was her duty to at least work and try to get out of it. That I had no time for her unless she gave up being mentally lazy; that if she were really willing to work I would continue to help, otherwise she needn't come to see me again." She looked at me in pained amazement, saying that no one had ever talked to her that way before. I replied that I was well aware of it but that I meant every word I had said. I of course never expected to see her again but to my astonishment she wrote me a letter a few days later in which she stated that she realized the justice of what I had said and that she would really try to work.

As a matter of fact she did much better from that time on. She evidently needed just that discipline apart from the analysis. *She also showed the great selfishness and total lack of altruism*, the result of poor training, which made it difficult to get her interested. In this connection she wrote: "I cannot do things for my people. They have always taken care of me and done a great deal more for me than they should have done and, sick or well, they have worked for me and I want them to continue to do so. If they all die—and there is very solid ground for my anxiety about them—who is going to take care of me? Who is going to get me all the things I've been having? If they die the only thing I can do to earn my living is upstairs work or something of that kind—noble ambition, isn't it? And I've felt quite sure that no one would keep me long because I scream so sometimes. I want everything for myself. Selfforgetfulness and self-sacrifice have had absolutely no part in my life. It is *ME* all the time. There isn't a single other thing I really care about." After the disciplining she worked really very well, i. e., for her. Being decidedly intelligent she was able to grasp the elements of the analysis and gradually became less uneasy although she had her bad days. She took a short course in gardening at Cornell and did considerable good work in her own garden. She also learned to become more altruistic in her general attitude. About three months ago after not having seen her for about four months, she wrote me a closely written twenty-page letter in which the nucleus of the whole trouble was very clearly revealed. The statements are too frank and concrete to be repeated but in substance she said that her mother, not being well at any time when she was a child, her father assumed the care of her and attended to her bodily wants including defecation and micturition. She adds: "My mother didn't know it made any difference, I am sure."

She then speaks especially of an occasion when her father thus cared for her in a public toilet in an office building where there were pipes and tanks and certain appliances which she had not seen at home. She ruminated about them and finally connected them with the genito-urinary system concerning which she later read considerable in her brother's medical books,

so that she had quite an exact knowledge of these matters. This explains the phobia about the water and the pipes and shows that it all belongs to the main complex. The water also had a relation to her habit. She "hated, loathed and abhorred" her father most when he went to the bathroom, because it made her uncomfortable and she said "um" over and over in order not to think of anyone in the house especially her father when she did what was bad because "he was the last person in the world she wanted to think about in connection with bad things."

She also shows in this letter that she had a certain attraction towards the brother who died although it was not as pronounced as the attraction towards the father.

After the writing of the letter she called at the hospital to ask physician whether it were really possible that her abnormal mental state could have arisen out of the happenings that had come back to her memory while she had written the last letter. She was told that such was indeed the case and that it was just these faulty factors in the upbringing of children which physicians were cautioning parents against at the present time. She discussed the situation in a very intelligent way, realizing the danger that some children ran in this way, and her manner which formerly had been furtive and uneasy was much more straightforward and normal. She stated that she was doing considerable work at home and in her garden and while she had not as yet been able to break herself of the habit, she was not as confused and disturbed mentally. She asked whether there were any local measures to cure the existing condition and when told that, as the habit had in her case a mental origin it must be overcome mentally, but that the alcohol injection of the vulva might be done as a last resort, in case she did not succeed, she felt much relieved and promised that she would continue to work and try to get better. I have not seen her since that time but have no doubt that I shall hear from her in the near future.

Although this patient is far from well and of course never will be entirely normal, she is certainly much better than she was when she first came. At any rate she has been kept out of an institution where she probably would be an almost impossible patient, especially if committed. She evidently has at times a great desire to give way and let herself go, for she wrote in one of her earlier letters: "I have thought that there might be a possibility of my going to the insane asylum to stay, perhaps forever, and I would like that better than anything else in the world, ever so much better than a trip to Europe." She asked repeatedly about the advisability of going to a hospital for the insane but I always advised strongly against it as that would probably mean in her case the end of all effort. While the analysis of the mental content in a case of this kind is an extremely repugnant affair, the question is not, whether we find it disagreeable to wade through the mire but that, as the patient said about her religious thoughts, these are the things this class of patients think about and these are the thoughts which underlie their fears, obsessions and symbols. If we are able to alleviate the fully developed condition in the adult even to some extent, there would seem to be some hope of preventing

the development of such an appalling condition by a proper mental hygiene in early childhood. While it doesn't seem probable that a normal child with the proper balancing faculties could get into this condition, we cannot always know which children are the susceptible ones. Through a knowledge of the facts obtained in studying these cases we can warn the mothers of the danger of caring too assiduously and too long for their boys and the danger that the girl runs when the father undertakes these duties; also of the danger of young children sleeping in the room with their parents or in the same bed, for we find that at five years of age the danger is already great. We learn also how necessary it is to instill the lessons of unselfishness and altruism at a very early age if they are to be learned at all.

CASE III.—M. D., æt. 25, American, of Scotch and American parentage; an only child; without settled occupation, daughter of a lumber dealer. Was admitted to the Buffalo State Hospital as a voluntary patient August 23, 1910.

Family History.—Father died at 54 of "meningitis and nephritis" having been forgetful for several months before death, and attending physician feared "brain softening" (syphilis?). Mother impresses one as a fussy woman lacking somewhat in judgment. Maternal uncle committed suicide during an attack of depression. No further history of insanity or neurosis for two generations on mother's side and for one on father's side. Both parents were temperate.

Personal History.—Was born in Buffalo and is said to have been a healthy baby. At two and one-half years of age was hurt in a runaway accident and was unconscious for a short time. No further details obtainable.

When between four and five years of age she complained of being sick and of having a lump in her throat. The condition lasted for three months and during this time she ate no solid food, saying that she was unable to swallow it.

While she finished the primary school at the ordinary age, she had evidently difficulty in grasping the more advanced work. She left high school at 19, before finishing the second year, on account of nervousness. Was considered rather peculiar. Very quiet and reserved; liked to read Shakespeare and novels of a decidedly sensational character. Attended the theater a great deal and wanted to be an actress. Did little work about the house; was careless—had no system. In disposition she was headstrong and was always given her own way. Menstruation was established at 14, occurred at intervals of five to six weeks; was normal in amount but accompanied by some pain.

Onset of Psychosis.—Gradual, about four years before admission, at the age of 21. Mother stated that at this time she first began to develop peculiar ideas and phobias along various lines. Talked much about the microbe theory and at the time of her father's death a few months later, she was afraid to remain in the house, to touch father's body, or anything

her father had handled, fearing that she would develop some infectious disease. *Complained of feeling weak, of having a lump in her throat, and for three months ate no solid food, claiming inability to swallow.* Mood was very changeable.

Two years before admission mother removed from Buffalo to a small nearby town as patient was afraid to remain longer in the house.

In March, 1910, she developed the idea that she had some pelvic trouble and five months before admission had a laparotomy performed—shortening of the round ligaments, exsection of some small cysts from both ovaries and appendectomy. After the operation she became decidedly worse, more nervous, wanted to be alone; complained of being unable to move; that she was going to die; wanted a physician all the time and begged to have her life saved. Lived on milk and raw eggs, claiming to be unable to digest other food and while under this regimen she gained considerably in flesh, she became progressively worse mentally and was admitted as a voluntary patient on August 23, 1910. She desired treatment on account of her weak, nervous condition. Complained especially that she could not get her breath and feared every moment that she was going to die. Begged us to do something for her to save her. During the night following admission, she was very restless, moaned a great deal and the following morning she immediately told physician that she was dying; asked us to feel her pulse as she knew that it was nearly gone; that she was almost unconscious from weakness. She was panting for breath; said that everything looked different—dim, blurred and indistinct. While her stream of thought was coherent, it was frequently interrupted by statements about her supposed critical condition.

In the course of the analysis she gave a history of an abnormal preponderance of sexual ideas and of certain perversions from early childhood up. Being the only child and mother being sickly, she (patient) was allowed to sleep with the father in place of the mother until ten years of age, when the mother stopped it because she feared that the neighbors would talk. Later she would often ask father to lie down on her bed when she wasn't feeling well. Before ten years of age she already had considerable knowledge of sexual matters from hearing other children talk. When nine years of age a boy of her own age exposed himself to her and she to him and about this time she commenced to masturbate.

When a little older she was inclined to be forward with boys, flirt with them and say suggestive things. At 16, partly through her own forwardness, a boy of her own age assaulted her, inserting a finger into her vagina which she thinks hurt her permanently. She acknowledges that she continued to be forward with other boys, but in spite of this she thought the neighbors were unjust to talk about her, saying that she was a bad girl when in reality she tried so hard to resist temptation. Soon after this she saw a play called "The Power Behind the Throne" where a girl was unjustly accused of doing wrong and she realized what a good name meant; she wanted to be respected and stopped her flirtations but masturbated to a greater extent.

In the year 1904 or 1905 she developed her first phobia. She felt impelled to count to 8 or the multiple of 8, especially while walking or combing her hair; felt that her father would die in case she omitted it. This condition lasted for a number of months and then gradually disappeared. In the spring of 1907, while singing in one of the churches, she met a Dr. X who paid her considerable attention. While at first resisting any intimacy, she later allowed him to kiss her frequently which stimulated her sexually. She was inclined to be late for rehearsals and would have to hurry at the last moment arriving panting at the church and in a nervous state for fear Dr. X would not be there (difficulty of breathing on admission). She didn't really care for this man, was merely fascinated by him and their intimacy ceased after three months. *In the fall of the same year her father died and shortly before his death she developed a phobia of microbes.* Would wash herself three or four times in succession after touching the doorknob or anything else, for fear that a microbe was left on her; in fact her mother had to tie up the soap. She also feared that she would carry verdigris from the faucet and poison the food. When her father died she was afraid to touch his body or his bedclothing.

Soon after the father's death she and her mother removed to a nearby town because the living was cheaper there and because she was afraid to remain in the house where her father had died. A few months later she returned alone to Buffalo; boarded at the home of a friend of her mother's and worked as a clerk in a dry goods store. During this time she answered a matrimonial advertisement because she wanted a friend, feeling lonely since she lost her father. She soon entered into clandestine relations with the young man, going with him to a hotel on several occasions. After returning to her home in the country she would meet him when she went to the city to take her music lessons. As she derived satisfaction through her autoerotic practices, but not through the normal sexual relations and as she repeatedly had pain at this time, she thought she must have some pelvic trouble, hence sought relief through an operation.

Since the operation she has both masturbated and had sexual relations and as she still has pain in one ovary she thinks that she must have another operation and consulted the surgeon about it shortly before coming to the hospital.

She is superficially bright and shows excellent memory and preservation of school knowledge. Physically she is frail and poorly nourished with a high and narrow palate; otherwise nothing noteworthy. Cutaneous sensibility normal—no stigmata of hysteria found. After admission she continued for a time very sensitive; had marked ideas of reference. When she saw patients or nurses talking together, she believed that they were talking about her; thought that nobody liked her; that her brain was "vacant"; feared that she would become an idiot. On one occasion was found crying bitterly as *she was obsessed with the fear that she might kill her mother.* She felt greatly distressed to have such a thought when

she was so very fond of her mother and willing to do anything in the world for her.

She also stated that she had dreamed of stabbing her mother; felt the knife going in and awakened frightened.—*The psychosis is therefore plainly a "father complex" towards which everything else converges.*

We have:

(a) The neurotic condition—the lump in the throat—at five years of age while she was sleeping with her father.

(b) The frequent tendency to feel ill, after the practice of sleeping with the father had been discontinued and during these times asking the father to lie down on the bed. Evidently a desire of substitution for the mother since the mother was ill.

(c) The fear of touching the father after his death or anything the father had touched. An excessive reaction against the subconscious desire.

(d) The incestuous and erotic dreams—the fear of killing the mother, evidently an inverted wish.

(e) The apparent excessive devotion to mother with real disharmony.

(f) The seeking of a substitute—a friend as she felt lonely for the father, and inability to find satisfaction in the substitutes.

(g) The fear of microbes which while probably an expression of her autoerotic practices is probably also connected with the father.

It was impossible to obtain any explanation for the phobia of counting to eight or its multiple but it was found that she took the large quantities of milk and raw eggs to increase her sexual desire.

From the first the symptoms were analyzed very freely one by one with the patient and their origin made plain to her. Within a day after admission, she was told that the difficulty in breathing and consequent fear of dying was directly connected with her hurrying to choir rehearsals to meet Dr. X some years ago. The explanation seemed to be adequate as the symptom disappeared completely and has never returned. Whether the explanation is the correct one, I don't know for it may have been connected after all with the leading complex, but at any rate it was effectual from a therapeutic standpoint. She was then gradually shown that her mental distress was the result of an unconscious sexual attachment to her father in early childhood which caused her to seek the subsequent substitutes—that her impulsive thoughts to kill her mother and fear that she might do so showed her subconscious desire to take her mother's place and that her dreams showed the subconscious inclination toward the abnormal attachment; that there was present at the same time the conscious revolt against such relations out of which her disease had arisen. That it was not a sin as she felt it, but an unfortunate development out of circumstances over which she had had no control, and that while her parents were responsible for the condition, they had drifted into it from ignorance and were therefore free from blame.

She cooperated well and was willing to accept our explanations. She improved slowly but steadily. A year after admission she took considerable

interest in various kinds of work for which it had been very difficult to train her. She now was able to go down town without coming back exhausted and no longer thought that people were looking at her. At first she was always complaining of all sorts of ailments, fearing that a serious disease would develop and was continually asking for medicine; but as time went on, she learned to take considerable pride in overcoming minor ailments not mentioning them to physician until they were over with. Her general attitude towards life was a more healthful one and she stated that she slept well and was free from the distressing dreams. Her menstruation became painless and normal. She left the hospital fifteen months after admission in November, 1911, and has visited here from time to time since her discharge occasionally remaining over night. While she is not by any means recovered, she has gotten along very well at home with her mother. There still exists a certain disharmony between her and the mother; she feels that the mother does not understand her but she realizes the situation up to a certain point and is able to make the best of it.

CASE IV.—H., æt. 25, single, American, a teacher, daughter of a well-to-do cheesemaker, temperate.

Family History.—Father had an attack of depression lasting about six months when patient was between nine and ten years old. Was very self-conscious, downhearted; not suicidal. Was cared for at home and has not had any further attacks. Since patient's illness father has often talked to her about his own symptoms. One paternal uncle drank and was considered the black sheep of the family; he went to Alaska and nothing has been heard from him since. All the other paternal relatives are able, normal people. Maternal grandfather was a steady drinker and often intoxicated. Her only maternal uncle has always been intemperate and the son of this uncle is already somewhat intemperate. Both parents of patient are temperate.

Personal History.—She is the second youngest of seven children. When quite small was critically ill with inflammation of the bowels. No other illnesses or accidents. Received a high school education and taught school successfully for several years. Was a hard worker, taking her work very seriously. In disposition was *always quick tempered and very sensitive*.

Onset.—Gradual in February, 1909, six months before admission, when 22 years old. She began to show a disinclination to talk; paid no attention to what was said to her; felt depressed and thought that everyone was trying "to do" her. Believed she wasn't fit to live and had a very bad idea of herself; said she wasn't any good, there wasn't any use in anything and she was going to end it all. Appeared to be in a state of nervous tension, being unable to stay in any one place for any length of time. At times seemed dazed and not to know what she was doing; at others showed great impatience towards her mother; had a sullen, scowling look, darting sharp quick glances from under her lashes; she *imagined that people were watching her* and begged to be alone.

On admission, August 7, 1909, she was mildly restless, fidgeting about, wearing a worried abstracted expression, paying little heed to her sur-

roundings and saying nothing voluntarily. On questioning she made brief and often indefinite statements, averting her head, partly concealing her face with her hands, frequently half smiling, the smile not harmonizing with the ideas she expressed, namely, that people talked about her, assailed her character; that her family had lost all affection for her.

Orientation, mental grasp and memory were found to be good and there was no retardation evidenced except in a lack of initiative. Soon after admission she commenced to improve both physically and mentally and was discharged apparently recovered, seven weeks after admission.

She returned as a voluntary patient on March 6, 1911, the father stating that she had seemed well since leaving the hospital except that she had been more excitable and sensitive than before. Remained at home for a year after discharge and in September, 1910, commenced to teach again. Shortly after that she had some difficulty with her fiancé; found that he was dividing his attentions between her and another girl; commenced to worry about this and returned his letters. Soon after the New Year she had to give up her school as she could not carry on the work on account of her depression and uneasiness; would walk up and down and talk about her love affair; said she wished she were dead and threatened suicide frequently.

Three weeks before admission she suddenly laughed for a few moments, said she had shaken off her depression, was all right now and appeared perfectly well for three days when the depression returned.

On admission her attitude was essentially the same as when she first came to the hospital. She appeared depressed and seemed to be "on a tension." She volunteered little, hesitated considerably before responding to questions, sometimes halted in the middle of a sentence; at times did not answer at all or would say, "I don't know, I can't think; you can't help me anyway." Expressed a general feeling of hopelessness, felt that she had lost the power of concentration; thought that her people had no confidence in her; said that she hated her mother and brother which she knew was wrong. That she had done nothing in her life to worry about except that perhaps she had not attended church as regularly as she should have done. She showed some difficulty in thinking during special tests which appeared to be more the result of preoccupation than actual retardation.

In the course of further analysis it developed that a morbid way of thinking had existed since she was five years of age. At this time she remembers sleeping in the same bed with her mother and father and on one occasion, which made a deep impression upon her, she noticed the father's genitalia while he was exposing himself carelessly during the process of dressing. It stimulated her curiosity; she recognized him as different from herself and her mother and wondered what his relation to her mother was. On one occasion at least after that she remembers being in bed alone with him and experiencing a vague sense of pleasure when he caressed her; she recognized it as different from other feelings. After that the vision of the male genitalia would often come before her and she ruminated considerably about it.

At 14 when she experienced her first menstruation, she had a feeling of intense resentment. She felt disgraced, "dreadfully so" as she expresses it, and even after her mother had explained to her about the menstrual function this feeling of resentment persisted. Soon after, she developed a fear of her father and felt that he had changed towards her. While she had been his pet in childhood, he seemed to have become less affectionate towards her. She craved his affection and yet she feared him. This fear still exists. She also felt that her mother did not try to understand her and she did not get along well with her.

From 18 to 20 she received the attentions of a young man who was *persona non grata* to the family on account of his intemperance. She cared a good deal for him but never quite trusted him. While with him her attitude was always normal but when away from him she was much troubled by "impure thoughts," the vision of the male genitalia, not always associated with any particular man, and she also occasionally imagined herself having relations with her fiancé. She tried to banish these thoughts; was ashamed of them. At the same time *she was afraid of herself*; she wanted to do right but feared that she might be led to do wrong by her other impulses.

In September, 1908, nearly a year before coming here for the first time, she broke the engagement at the instance of her family. Was, however, still fond of the young man, thought much of him and continued to struggle with her abnormal thoughts. In January, 1909, another young man, to whom she was affianced until shortly before her second admission, began to pay her attention, but it did not make her happy. She felt that on account of her impure thoughts people were looking at her; that her girl friends treated her differently from others and she obtained momentary relief only by shutting herself in her room.

During her first stay in the hospital her thoughts were essentially, as previously noted, but she managed to rouse herself out of them to some extent after a time; after returning home they recurred and she felt more keenly that her mother was hard on her and treated her differently from the other members of the family. She cared a good deal for her fiancé and was much distressed when in September, 1910, he made an improper proposal to her. She did not have the courage to dismiss him as she still loved him but when shortly afterwards he wrote her that he was interested in another young woman and that he had never really cared for her, she felt mortified that she had allowed him certain liberties, such as allowing him to kiss her in public at the station. She believed herself partly responsible for the improper proposal on account of her abnormal thoughts and is convinced now that his one object was to ruin her.

She further gives an interesting account of dissociation of personality shortly before returning to the hospital. She states that she felt herself followed by another self wherever she went. Could see this self which looked like her, quite distinctly; it would mock her and make fun of her and finally became so annoying that she felt like committing suicide. She states that she heard the voice of this other self as distinctly as any other

speaking voice. For several months after admission she varied considerably; at times talking readily and taking a moderate interest in her surroundings again morose, seclusive, irritable with sudden attacks of resistiveness. Six months after admission she had a violent outbreak of disturbance; threw herself out of bed, resisted attention and feeding; was very profane and rolled around the floor in a nude condition; tearing everything that the nurses put on her. Some time later she explained that during this period of disturbance she was in constant fear of being killed. Thought that she was either to be burned or hanged in a nude condition in a public place before a crowd of spectators, and that this would bring a terrible disgrace on her family; that this punishment was to be inflicted upon her on account of her inefficiency, of not having been of help to others when she had the opportunity, and for having drifted into a condition where she couldn't help herself. She didn't think that she was to be punished for immorality although she heard herself continually accused of immorality. Thought that when other visitors came into that part of the ward, that they were brought in to see her, she being pointed out to them as an immoral person. Thought the nurses were talking about her whenever she saw them talking together. During this time she repeatedly saw her former fiancé on the grounds; thought he had come here to annoy her. She also thought that her body was filled with poison and that everyone who came in contact with her would be affected by it; this was why she didn't want the nurses to touch her. She smelled the peculiar odor of this poison on her hands; found it different from any odor she had known. She tore her clothing and lay nude on the floor because she felt undeserving of any clothing and knew that it was going to be taken away from her in the end anyway. Her attempts at suicide were efforts to anticipate the public execution and thus save her family from disgrace. For two months, in November and December, 1911, she appeared very well, interested in things about her and generally easier. Then followed another short period of irritability with renewed improvement so that she went home on parole on February 28, 1912.

Six weeks later, on April 8 she was returned, having shown great irritability and disturbance at home with marked suicidal tendencies. It was the same story. Complaint of unkindness on the mother's part, who purposely misunderstood her and whom she characterized as "repulsive to her." After her return she remained irritable but got along fairly well until June, 1912, when without provocation she attacked the nurse and tore her uniform. She considered her dignity compromised and all her actions misunderstood. It was finally learned that she was much disturbed mentally about the crime committed by Richeson, the convicted Massachusetts clergyman who was about to undergo the death penalty for having poisoned a young girl for whose pregnant condition he was responsible. Patient had a number of horrible dreams in consequence; saw her cousin kill another man before her eyes. Carried these distressing impressions into the day with her which made her so uneasy that she couldn't do anything. She would not enter into any further analysis of the dreams. After

the subsidence of this attack she again got along very well for two months when a renewed attack of irritable depression supervened. She stated that the impure thoughts, i. e., the vision of the male genitalia, were again controlling her mind to such an extent that she felt unable to concentrate on anything. That she is thoroughly disgusted with herself for having these thoughts but that she is utterly unable to control them. She has the feeling that all men are bad and is continually in fear of an assault; has lost her faith in all of them and feels that everybody is a hypocrite and that they are all doing everything in their power to make her lose her temper. She distinctly states that at these times of depression she does not find things unusually difficult but feels that she could do them just as well as ever if she were only relieved of the thoughts referred to. For the next two months she varied as usual until finally in December, 1912, an unusually violent attack of disturbance occurred when she used the most profane and obscene language possible, tore off all clothing and struggled continually with the nurses, requiring several hypodermics in the course of the night to obtain a semblance of control. At present she is again quiet and self controlled, occupies herself with reading, studying and fancy work and has parole. But she lacks a real *vis a tergo* in her work and on close questioning it is learned that the old undercurrent persists, and will probably break through again in the near future.

Physically she has never shown any variation from the normal with the exception of a slightly enlarged thyroid. There is no history nor evidences of masturbation.

While we have then in this case superficially a manic depressive reaction type, on closer study we find the case lacking in the manic depressive characteristics—there is no real depression, no real retardation, and a comparatively small admixture of the autopsychic element. We have on the other hand a morbid sexual undercurrent, the first symptoms of which date back to five years of age; *the principal symptoms being an automatism of thought* through which crude sexual images fill her mind at certain times to the exclusion of all healthful activity. When these impressions reach a certain stage of control an emotional outbreak occurs. Through morbid ruminations at five years of age, an unconscious attachment was produced to the father accompanied by fear, i. e., an inverted desire and a feeling of resentment against the mother, her rival, which first manifested itself at the age of puberty. As a result of this the impossibility of a normal adaptation to her men friends. This mental preoccupation which was probably evident in her manner, was also probably the cause of the emotional traumata which she experienced in the course of her engagement. The whole mental picture is a decidedly crude one with very little attempt at symbolization. An interesting feature is the temporary dissociation of the personality without any stigmata of hysteria.

CASE V.—K. J., æt. 25, American, of German parentage, daughter of a watchmaker.

Family History.—Negative as regards insanity. Father is a very intemperate and immoral man. Paternal grandfather and uncle also very intem-

perate. Mother is a frail, timid, vacillating woman, lacking in stamina. There were eight children of whom our patient is the seventh. Four died in infancy; sister of the patient is very nervous and has separated from husband—two brothers are said to be well.

Personal History.—When three years old complained of pain in one ear, had fever and several convulsions. Recovered in a week. No convulsions since. Had the ordinary diseases of childhood and while living in Texas six years ago had severe malarial fever. Is said to have been bright in a general way as a child but always found her school work rather hard and was *somewhat seclusive and obstinate.*

Psychosis.—Patient sought admission as a voluntary patient on April 4, 1910. Complained of feeling depressed and obsessed by suicidal thoughts. Felt that people were looking at her and that they were accusing her of immoral conduct. She believed her condition to be the result of masturbation which she had practiced since six years of age.

She gives the following account of the development of her trouble:

When six years old she learned the habit of masturbation from her two older brothers. When she was ten years of age her father, who is a very intemperate and immoral man, commenced to have incestuous relations with her eighteen-year-old sister, whose room she shared. This continued for several years and he finally tried to induce her to go to Mexico with him. Witnessing these terrible scenes increased her own habit.

When about fourteen she realized that she was doing wrong and tried to discontinue the habit but unsuccessfully. She found her school work hard as she couldn't concentrate; everything would suddenly go out of her mind, even if she thought she knew her lessons. She finally lost interest entirely and left high school at the end of the third year.

Her mind has gradually become completely obsessed by sexual ideas. She can think of nothing else and everything suggests them to her. She is frequently annoyed by a crawling sensation below the border of the ribs on the left side followed by contraction in the vagina. At these times she sees men nude before her. She has changed from one occupation to another and latterly has come down to housework. Left her last two positions after a short time as she thought that people were looking at her and making remarks about her, accusing her of having immoral relations with men. These were not actual hallucinations of hearing but "thoughts." She feels that she cannot live at home as they all accuse her of wanting to run the house. She is out of harmony with her married sister (the one who had incestuous relations with her father) and feels that the latter is not training her child properly. She is worried about her brothers; feels that on account of their early habits they are not the same as other young men although they themselves do not realize it. She feels selfconscious before them because they knew of her early habits. Perhaps they try to help her but don't know how. *The greatest difficulty is with her father.* She is afraid of him because he often looks at her in a strange way. This fear is especially marked when she is alone with him. She is afraid that he may assault her sexually as he did her sister because she knows that

his will is stronger than hers. Her mother, she thinks, means well enough but is ruled by, and sides, with the others.

Physically she showed nothing beyond a moderately enlarged thyroid.

She brightened up to some extent during her four months stay at the hospital but while she came here ostensibly to get over her abnormal thoughts, she states that "she doubts whether she is serious enough in really wanting to get over them. She wants to and yet it seems as if she doesn't want to."

After her first discharge she gradually drifted down and became more and more inefficient. At home she was irritable and quarrelsome, read a great deal of poetry and wrote for hours an incoherent mass to no purpose. She finally drifted again into the hospital late one evening appearing confused without any definite idea of what she wanted to do. Talked in an aimless way about wanting "to face it," but couldn't explain what she meant. Threatened to commit suicide if there was no help for her. After admission she was very uneasy with frequent impulsive actions, jumping out of bed suddenly and hiding; with marked ideas of reference—thought the nurses talked about her. She again brightened up to some extent and left the hospital five months later, the mother refusing her consent to commitment.

On April 6, 1912, when she returned for the fourth time she expressed the idea that she was nearly gone physically, on the verge of cancer in fact. Pointed to a harmless abrasion on the toe, saying that it was a serious affair, that it was surely cancerous; that it would cause the loss of the foot and in this way her whole body would go. It was learned that her mother had developed carcinoma of the uterus and this was evidently an effort at identification with the mother. She continued excessively solicitous about the mother, accusing father of having brought about her mother's illness and unhappiness through his intemperance. In spite of this she showed very little real emotion when the mother actually died. Her resentment against her sister now became redoubled but her attitude towards her father changed markedly. She asked physician to allow her to go and see the father as she knew that he was doing better—drinking less. Indicated the hours when she was most likely to find him at home. As a matter of fact the sister wrote us that she had been obliged to leave the house as her father had been much worse since the mother's death, and was absolutely impossible to live with. *From the symptoms—the fear of the father, the identification with the mother in regard to the cancer, the hatred of the sister who had had incestuous relations with the father, the oversolicitude about the mother during her life time with indifference at her death, followed by redoubling of hatred of sister and makebelieve of father's improvement and her desire to see him—we have undoubtedly a father complex as the underlying factor.*

Owing to the comparative crudeness of the concepts and their nearness to the surface—the attempt at disguise being extremely meager, psychotherapy has been of absolutely no avail. She has become more and more incoherent in her mode of thought, negativistic and antisocial—a typical

præcox attitude. The keynote of her non-improvement is probably found in her own saying "that she doubts whether she is serious enough in really wanting to get over it." She is evidently satisfied with the situation although she makes now and then a makebelieve protest.

CASE VI.—A. T., æt. 27, born in Buffalo, of German Lutheran parents, divorced, temperate.

Family History.—Father very intemperate. Maternal uncle was insane—details not obtainable. There were ten children in the family of whom patient is the eighth. One brother is very nervous and irritable; cannot hold a position. No other instances of insanity for three generations.

Personal History.—Childhood normal. Learned well at school, finishing eighth grade at 14. Liked games and company. Helped mother until 16 when she obtained a position in a box factory. Married at 19, had one child which died at seven months, presumably of whooping cough. Husband was very intemperate and shortly after marriage infected patient with syphilis for which she was thoroughly treated for two years. After death of child she left husband because of non-support and worked as a packer in a soap factory until two days before admission.

Onset of Psychosis.—Sudden, two days before first admission at 25 years of age. Shortly before closing hour at the factory she complained to another girl that she had not accomplished much, that everything seemed difficult. The next day after a sleepless night accused mother of being a witch and of exercising some spiritualistic influence over her; later accused family physician and minister of exercising the same influence. The following day thought mother was trying to poison her; talked to imaginary people; said she saw spirits. Relatives believed this to be caused by the fact that she had attended spiritualistic revival meetings during the winter. Finally she became so restless and violent, attacking mother and throwing her out of bed, that commitment became necessary.

On admission, April 19, 1911, she showed moderate distractibility, some trifling and an occasional indication of flight but no actual pressure of speech although she talked considerably voluntarily. Her ideas revolved principally around religious and sexual topics with ideas of influence, fleeting in character, showing a loose connection but very little elaboration.

"She is the blessed Virgin, wants to go to Heaven because she doesn't want to do wrong. While in her family physician's office saw a picture of Pontius Pilate, which changed to Martin Luther; then a rooster crowed and the church bells commenced to ring. Later someone said 'Scisson,' who is a hypnotizer; she has felt the electricity and the light. The fortune teller told her it was Scisson."

Later when she quieted down it was learned that she had been subject to numerous sexual traumata. When a small child, and being the youngest girl, she used to sleep with her older brothers and was enlightened by them on sexual matters at an early age. When 8 or 9 years old she commenced to practice masturbation which she has continued more or less to the present time. At eleven, while her brother had measles, the mother

had her sleep with the father, a very intemperate man, who attempted incestuous relations. She defended herself, realizing that there was something wrong about it. At 18 she became illegitimately pregnant. Felt very badly about it and thought of suicide, getting a bottle of poison unbeknown to the mother. On the evening of the day her child was born she was married to the father of her child but was not happy with him as he drank and did not support her. She was fond of her baby and felt badly when it died. Soon after baby's death she separated from her husband. She had no other serious love affair but flirted considerably with a conductor named S—. She always tried to do right but feared that she might do wrong. About a month before admission she went to a spiritualist who pretended to show her her sister's spirit and told her that she (patient) had the power to become a spiritualist.

At the hospital she varied between excitement and depression for a month; then became normal in her manner, interested in work, associating pleasantly with other patients, showing excellent insight; left the hospital two months after admission and was discharged recovered September 30, 1911, five months after admission.

Readmitted as a voluntary patient on May 16, 1913, because she is depressed; thinks that a man friend has an influence over her, draws her to him, talks to her and tells her what to do and to wear. Sister states that patient was well for one and one-half years after her discharge. In November, 1912, she became sleepless, lost her appetite; this followed closely upon her employer's accusing her of having transmitted vermin to her son. It was also learned that this woman had made patient believe that a boarder (the policeman S.), formerly a street car conductor, was in love with her and that this same woman had induced her, unbeknown to her (patient's family) to obtain a divorce from her husband. She developed crying spells and later became excited; pulled clothing out of drawers and strewed it about. Struck her mother saying, "I could kill you." Thought mother was trying to poison her which was her reason for not wanting to eat; when she did eat at the table she stirred up her food and expectorated into it. She also claimed that the policeman, referred to above, had baked a cake which contained something that had made her insane. On admission she appears dull and depressed, has tears in her eyes. Is cooperative; she volunteers little; speaks slowly but expresses no subjective difficulty in thinking.

She states that since November she has felt her former employer, Mrs. T, drawing her against her will to her house and that this woman's boarder, the policeman S—, has been hypnotizing her and subjecting her to immoral relations while under this influence. Knows that it is his influence because she frequently hears his voice. Sometimes it sounds like an ordinary conversational voice; again it is a wave that comes up from the pelvis and becomes a voice in her chest. She feels that this man's spirit has entered her body and controls all her actions. During the analysis she stated that while she never cared for her husband, she had cared for Mr. S and had hoped that he would marry her. He intimated as much when

he told her that he would come to see her after she obtained her divorce; since she secured it, however, he has not asked her in marriage and she thinks that possibly he is already married. In fact she has been told so. She now no longer wishes to marry him as she believes him to be a bad man since he has annoyed her to such an extent. The mental functions in all other fields are perfectly normal and she shows nothing physically beyond exaggerated patellar reflexes and a slight systolic mitral murmur.

In this case *we have then traumata very similar in character to those found in the first five cases* but we have an entirely different reaction type. While she has in both attacks had short episodes when she struck her mother because she thought the latter had bewitched her and said she could kill her, she has, aside from this, shown a very normal attitude towards the mother. During the first attack she spoke a few times of seeing her father expose himself and of her brother sitting on her bed and testing her but these were actual occurrences and there are no indications of elaboration or conversions. We have, during the first attack, indications of a real attraction towards a certain man outside of her family which later became intensified resulting during the second attack in crude sensations which she interprets as occult influences emanating from this man when they become too insistent and when she is disappointed in reaching the goal of marriage. The early bad mental hygiene while not producing a father or brother complex, has yet injured her emotional life to such an extent that she cannot control the impulses arising within herself and projects the cause for them outside of herself. While the picture in the main suggests a manic depressive reaction type it is not pure and the prognosis is probably ominous on account of the strong sexual trend which will probably always give rise to conflicts.

CASE VII, C. D., æt. 55, born in Germany, married, wife of a boilermaker, mother of one child 19 years of age, temperate.

Family History.—*Father was very intemperate*; otherwise normal mentally. *Mother died in Utica State Hospital* when patient was seven years old. Patient's only *sister had an attack of acute mania* during lactation. Recovered in three months. Her only *brother* is confined at Buffalo State Hospital with *dementia præcox*.

Personal History.—Was considered a normal girl but unable to learn much in school. Can read a little but cannot write although she went to school from 7 to 13. After leaving school worked as a charwoman, cleaning by the day. Had an illegitimate child at 20 and lived with the father of her child, O. W., for nine or ten years. Ten years ago married a widower with whom she has been very happy. He states that she has been a sensible woman, a good housekeeper but somewhat nervous and talkative.

Onset of Psychosis.—During the summer of 1906 she was flighty for one week after which she returned to her normal condition. On October 13, 1906, a month before admission she showed sudden excitement during the night. On awakening from sleep jumped up suddenly and rushed up to husband, saying, in a happy frame of mind, "We are all saved now." Later

showed more confusion; worried about her boy; repeatedly went to the door to see whether he had come in; upset furniture. Thought the neighbors were talking about her, calling her vile names; that they had all turned against her; were listening to everything she said. Attempted several times to escape from the house barefooted carrying a religious picture. On day preceding admission tried to strike son with a piece of wood and later struck husband because he did not answer her question and because she thought that he had locked the door to keep her son out of the house.

During the mental examination following admission she impressed one as somewhat simple minded and emotional. She was loquacious and circumstantial in her account and reiterated a good deal. Was apprehensive of impending harm. Said, "If I have made any trouble I am willing to pay for it. I don't care if I had died as a child; I would have been better off." Later said, "Don't take my life. If I could only jump out of the window. You ought not to take my head off. I cannot explain. My husband should support me. God always takes care of his people even if they have a great many children." She worried because her clothes were dirty when she came. Wanted us to send for the priest to tell him about it as she doesn't want to lie before God; doesn't want to make any trouble.

She was thoroughly cooperative. Orientation and memory were fair, and although her stock of educational data was practically nil and general experience very limited, she showed a keen appreciation of duty; wished some responsible person to take charge of her brother's money as she was his guardian.

Her depression and apprehension lasted only three days after which she became bright and active, showing great interest in the work of the ward, in fact had to be watched as she was inclined to overdo. She explains her nervous attack on the grounds that recently her husband's sister had reproached her for having had an illegitimate child. Patient states that she had told her husband about it before marriage and nothing had been said to her about it previous to this time. This would explain the ideas she expressed that "the neighbors were talking about her and calling her vile names; that her husband had locked the door to keep the son out of the house and the remark that her husband should support her; that God always took care of his people even if they had a large number of children."

The second line of delusions, "The sudden feeling that everybody was saved," which she expressed in the middle of the night on awakening from sleep, is explained as follows:

She had been worrying considerably over the fact that her sister's children had never been baptized. Her sister's husband, being a Protestant, would not allow them to be baptized in the Catholic faith. Mrs. D, who was a devout Catholic, felt that the children would be eternally lost and when her brother-in-law died, two years ago, she felt at liberty to urge the baptism upon her sister, who however failed to comply with her request. The matter was on her mind constantly. During the night ushering in her

excitement she awakened out of a dream with the feeling that all sects had disappeared; that there was only one church and that consequently all people were saved. A distinct wish realization.

She showed no further excitement during her stay in the hospital and was discharged two months after admission with a very good appreciation of her illness and a thorough sense of responsibility towards her simple duties in life.

She has been seen from time to time by the writer—the last time about two months ago, as she visits her brother with faithful regularity. She stated at this time that she had been perfectly well since leaving the hospital and she appeared as well as at the time of her discharge.

We have in this case a woman with a very bad heredity who had a distressing childhood, was intellectually below par, and had an illegitimate child at 20. Her mind however seems to have been occupied not with sexual matters but with the work which was at hand for her to do. That she was not callous is shown by the admixture of depression during the attack at 52, which was probably partly the result of the reproaches on the part of the sister-in-law relating to her illegitimate child. Her worry over her sister's children shows considerable altruism and the nature of the attack—the wish realization—a fair degree of imagination. The reaction type is entirely different from that in the *præcox* cases; while these are steeped in a selfish line of wish realizations, principally of a disguised sexual nature, towards which their whole line of thinking converges to the exclusion of all other interests of life, the wish realization in this case is an altruistic one; there is a desire to rise above difficulties and to do the best possible in life; to lay hold of the balancing influences as soon as the perturbing factors are in some degree adjusted. It is a matter of isolated disturbing complexes amenable to treatment instead of a lifelong ingrained abnormal development; hence the satisfactory outcome.

CASE VIII.—E. B., æt. 31, American, of Irish parentage, married, mother of one child, temperate, admitted November 21, 1911.

Family History.—Nothing known of father's family as they are all in Ireland. *Father is a moderate drinker.* Maternal grandparents are healthy, temperate people. *One maternal uncle is a moderate drinker. Three sons of a maternal aunt are very intemperate.* Mother is a healthy, well-balanced woman.

Personal History.—Is the youngest of three children; the other two are living and healthy. She had the ordinary diseases of childhood. Graduated from high school at 22, got along well with her studies, was jolly, full of fun, fond of her boy and girl friends. Being the youngest, life was made rather easier for her than for the others. She was not taught to sew or do housework, and had no responsibility outside of her school work. After graduation clerked and later entered the telephone exchange where she worked hard and was rapidly advanced. She lived quietly at home, giving her earnings to her mother. *She never had any trouble or emotional traumata until she became illegitimately pregnant, the father of her child*

being a man she had known for six or seven years and to whom she was engaged to be married. When she found herself pregnant she became depressed, felt that she had disgraced her family; concealed her trouble from them and when between five and six months pregnant, consulted the Bishop of Scranton who because of her former unblemished life gave his sanction to the marriage but advised her to go to Buffalo. She was married in Buffalo to the father of her child but continued to worry about her sin; *believed that she would die in childbirth as a punishment.*

Onset of the psychosis was rapid, immediately after the birth of her child.

While being given chloroform during delivery she saw a horrible face—the devil's—revolving before her. After regaining consciousness, she remained clear until a few hours later when chloroform was given a second time for repair of the perineum. At this time the vision of the face returned and in addition she saw herself in hell with a great many people some of whom she had known, others whom she did not know. Thought that they were all being condemned on account of her wrongdoing. Continued to see the devil's face on the counterpane, on the food, touched it with her hands. Heard her cousin's voice saying that she wished they might wash her body since she was dead; heard that the priest had been refused permission to administer the last rites as she was too wicked to receive them.

On admission three days after onset, thought she was being brought in an undertaker's wagon to an undertaker's establishment; this alternated with the idea that she was in hell.

Five days after admission she was free from hallucinations of sight and hearing but she continued to feel that her soul was lost and that she would never get well. After gaining her confidence she very reluctantly told her whole trouble which gave her a certain amount of relief but it required seven months of constant training and encouragement before she finally adjusted herself to the situation and was willing to make the best of a fault which could not be undone. Physically she showed only slight exhaustion but a goiter with moderate tachycardia. After leaving the hospital on June 1, 1912, she reported regularly and showed excellent judgment and a clear-eyed outlook upon the world. Soon after discharge she again became pregnant but accepted the new burden in a cheerful, wholesome spirit. We have recently learned that she passed through delivery in a perfectly normal manner and is very happy in the possession of her two children.

In this case we have a grave emotional trauma at 31 which produced a depression of seven months duration. While we have a short toxic exhaustive period of about a week's duration, possibly brought out by the chloroform, we have after recovery from this, a persistence of the depressing emotional factor with final complete adjustment after seven months. There is every reason to believe that the patient will remain well since we have one distinct disturbing emotional episode in an otherwise normal development, the search for earlier traumata having been ineffectual.

SUMMARY AND CONCLUSIONS.

In comparing the first five cases we note in all a poor family background in which neurotic tendencies and intemperance figure prominently. In Case I, the father was sent to prison for some moral offence and the sister is physically stunted and nervous. In Case II, the father, paternal aunt and brother were very nervous.

Case III shows the father possibly syphilitic, forgetful at 54 and mother fussy and nervous.

In Case IV the father had an attack of depression from which he recovered; one paternal uncle, maternal grandfather, one maternal uncle and maternal cousin were intemperate.

Case V. Father very intemperate and immoral; mother weak, lacking in stamina. The social status varies from poor to well-to-do but on the whole is of a fair average.

The age at which the patients came under observation varied from 25 to 35; one patient was married, the others were single. In disposition they were characterized as "quiet and reserved," "Quick-tempered and very sensitive," and "seclusive and obstinate," while nothing could be obtained in regard to the other two.

All gave a history of bad mental and moral hygiene. In three we have a history of masturbation, commenced at 6, 9 and 14 years of age respectively. In one case the practice was denied but there were evidences of the habit and in one there was neither history nor evidence. In four of the cases we obtain a history of the patients sleeping in the parents' bed until at least five years of age; in one case until 10, in another until 7 and in one until 12. In the fifth case incestuous relations between the father and sister were witnessed at 10.

It is rather interesting to note, that in several instances the earliest symptoms are dated back to five years of age.

Case I had anxiety dreams and hallucination of sight at 5.

Case IV saw father's genitalia at 5, commenced to ruminate about them and the vision of these organs later became an obsession.

Case III complained of a lump in her throat when between 4 and 5 years of age and for three months could not eat any solid food. This symptom recurred in exactly the same way at 21.

In three cases we have a fear of the father; in two this fear developed at puberty.

In two we have fear of touching the father's body after death.

Physically we have a variation from frail to excellent and three had enlarged thyroids.

As regards diagnosis two might be classed as psychæsthenias, one as allied to manic depressive insanity and two as præcox but it seems to me that we have in all of the cases essentially the same mechanism; that they are all really of the præcox type because they all show a more or less shut-in personality, a living for self without any real altruism or self-forgetfulness and a consequent inefficiency. From earliest childhood they appear to have a special affinity for sexual matters and their interest centers around these rather than around the other influences of life. On this account too, they are probably so subject to traumata. It is not a question of one, two or even more traumata, but it is essentially a faulty habit of mind.

One case showed a strong homosexual trend and none showed a well rounded sublimation of the sexual instinct.

It is rather interesting that the five patients happen to be Protestants—two Lutheran, two Presbyterian and one Baptist. Dr. Freud's cases belonged principally I take it to the Hebraic religion, and it would be interesting to know whether Catholics are as subject to this particular reaction type or whether perhaps the early habit of confession, commenced in their church, I understand, at about 8 years of age, straightens out some of the symptoms by ventilating their thoughts. In Catholics we find of course frequently the identification with the Virgin Mary, etc., possibly a homosexual complex.

Case III shows very conclusively why gynæcological operations in these cases are frequently unsuccessful. The underlying complex is not modified by the operation and is even as in this case often made worse. That neither bad heredity nor faulty physical development, like enlarged thyroid, are causes of the disease is shown by the fact that one or both are found in one or the other of the contrast cases. That the faulty mental hygiene in early childhood is not the exclusive factor is demonstrated by Case VI where we have with similar factors a different type of reaction, not a father complex. However the faulty hygiene acted here also as a grave emotional trauma which prevented a normal adjustment in early adult life. We have then still to admit

that there appears to be something else inherent in the individual to bring about this type. We realize the truth of what Bleuler says about paranoia, namely, that "In the majority of cases of paranoia there is a constitutional predisposition plus a chain of Freud's predisposing occurrences and that with the same physical and mental trauma, one person develops an incurable psychosis, another a transient hysteria, another a momentary fright."

There is no question in my mind about the help that Freud has given us in dealing with these cases especially in the less pronounced types. In this connection I would like to cite the case of a nurse who while in training was considered somewhat peculiar and antisocial but otherwise of a very good intelligence. Some time after taking up work in a distant city, she wrote me a letter on the eve of a serious operation, in which she confessed to homosexual thoughts towards a certain woman. She felt this mental state as a disgrace, felt that she would lose her reason if she had to live in this way and hoped that she would die during or as a result of the operation. I was at a loss to know just what to do to help her at this distance but finally wrote her a long psychoanalytical letter in which I told her that while hers was a most unfortunate condition it was not a disgrace but rather a disease which was encountered not infrequently by alienists. That it was usually traceable to certain traumata or faulty factors of mental hygiene in early childhood—explaining to her what these factors were—and that if she would trace back her life she would probably find something to account for that particular type of development in her own case, that although it was a misfortune, it was her duty to try to work out of it and I then laid out a reconstruction plan of her life in which altruistic factors formed a prominent part.

I did not hear from her after that for a year and a half when she wrote me a very wholesome, sane letter in which she stated that she had just successfully passed a certain examination for which she had been working. That now she would have a certain amount of time at her disposal outside of her work and she asked me to outline some study with which she might fill this time. At the end she thanked me for my letter which was the only reference

she made to the subject. I thereupon mapped out for her three different lines of work, either one of which would keep her busy for several years.

In this case the self analysis with the aid of the clue given her, was possibly more effectual than a prolonged analysis with the physician would have been.

While we can do but comparatively little with the fully developed cases since they appear essentially satisfied with their abnormal trend and only put forth a makebelieve effort now and then, it should be possible through the knowledge of these facts to do something along the line of prevention among children judging from the comparative success in the milder adult cases.

BENJAMIN RUSH, PATRIOT, PHYSICIAN, AND
PSYCHIATER.

A CENTENNIAL MEMORIAL NOTE.*

By FRANK WOODBURY, A. M., M. D.,

*Fellow of the College of Physicians of Philadelphia: Secretary to the
Committee on Lunacy of Pennsylvania.*

If we direct our attention to the curators of the insane at the beginning of the last century, there is one figure which stands out, *Primus inter pares*. It is that of Dr. Benjamin Rush, the American Sydenham, and the father of American psychiatry. He was born in 1745 at Byberry, which is now a part of the city of Philadelphia, where he lived his whole professional life. This year is the centennial anniversary of his death, which occurred at Philadelphia on April 19, 1813.

Benjamin Rush was the author of the first American treatise on insanity. This was the fifth volume of his cyclopedic work in seven volumes, and was entitled "Medical Inquiries and Observations into Diseases of the Mind," which, published one year before his death, subsequently passed through a number of editions. Dr. Tuke, in reviewing this work says that it "leaves the conviction upon the mind of the reader that he was an original observer, a humanely-intentioned, and, in many instances, a successful physician of the insane." Rush entertained positive and enlightened views on the subject of insanity. He regarded insanity not as a disease, but as many diseases, and of different kinds. He held that insanity is not merely mental disease, but a disease of the entire body. More especially it is not always the result of disease of the brain and nerve centers, but a large group of cases are caused by the blood and arterial excitement. As theory governs practice, he consistently advocated discrimination in the diagnosis, and the individual treatment of each patient according to the existing conditions. He maintained that "diseases of the mind can be brought under the dominion of medicine by just theories of their seats and proximate causes."

In his celebrated oration entitled "An Inquiry into the Influence of the Physical Causes upon the Moral Faculty," after

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referring to the memory, the imagination and the judgment, Rush said: "Persons who labor under the derangement, or want of these powers of mind, are considered, very properly, as subjects of medicine, and there are many cases upon record that prove that their diseases have yielded to the healing art."

On September 24, 1810, Dr. Rush addressed a letter to the Board of Managers of the Pennsylvania Hospital, in which he shows in every line his sympathetic regard for the insane patients, and makes several important suggestions calculated to increase their comfort and promote their recovery. Among these are (1) segregation of noisy and excited patients in separate buildings, (2) the separation of the male and female departments, (3) employment, exercise, and amusement for the patients, (4) special companions or instructors to share their amusements and converse with them, (5) the protection of patients from the intrusion of strangers, (6) the supply of comfortable bedding, etc.

Dr. Rush constantly advocated and practiced humane treatment of the insane, and condemned the abuse of mechanical restraint, although he permitted it in emergencies. In fact, he invented a special chair which he termed a "tranquilizer," and recommended its use in place of the strait-jacket and confinement in bed, as being "more comfortable for the patient." He also devised a "gyrator," a mechanical apparatus, by means of which centrifugal force was utilized to increase or decrease the quantity of blood in the cerebral vessels. Hydrotherapy held a prominent place in his treatment of the insane. He also held enlightened views upon the importance of other physiological remedial agents, such as regulated rest, exercise, employment and recreation, when carefully adapted to the requirements of the individual patient. He was a firm believer in the curative power of medicine in all conditions, and this led him to assume a hopeful and helpful attitude towards the insane.

The public services of Rush, while Attending Physician to the Pennsylvania Hospital, and his official connection with the College of Philadelphia, and subsequently with the Medical Faculty of the University of Pennsylvania, and notably his labors during the yellow fever epidemic (1793-1805), are matters of familiar history. His monograph, reporting his personal observations during this epidemic, is an acknowledged classic.

Rush became a member of the Philosophical Society in 1768 and took an active part in its proceedings for many years. His celebrated oration on the "Influence of Physical Causes on the Moral Faculty" was delivered before that society in 1786, before a distinguished audience, which included his friend, Benjamin Franklin, who was at the time President of the Supreme Executive Council and Chief of the State Government. An interesting occurrence took place at this function. The peroration of the address was devoted to praise of Franklin, in which such extravagant terms of laudation were used that this part of the address was omitted when the oration was published by the society. Rush was one of the founders of the College of Physicians of Philadelphia, and the first scientific paper was read before the College by him. It was entitled "The Means of Promoting Medical Knowledge." In 1787, the College of Physicians appointed a committee, to memorialize the Congress and Legislature, charged with the duty of calling attention to the evils of the intemperate use of alcoholic liquors and asking for their reduction by the enactment of laws imposing heavy duties upon distilled spirits. Dr. Rush was chairman of both of these committees, and it is evident that it was his great personal interest in the subject that led to this unusual action by the college. He was surgeon, and afterwards physician-in-chief, to the army and for a time served also as fleet surgeon. He was a member of the Convention of the State of Pennsylvania for the adoption of a federal constitution. He was treasurer of the United States Mint for many years and until his death. He was a pioneer in the movement to form the American Bible Society and was vice president when he died. His special interest is also shown by the fact that he published a pamphlet in defence of the use of the Bible as a text book in schools. He was a member of the Abolition Society, and among the first to design an African Episcopal Church in Philadelphia. He was one of the founders of Dickinson College, and was a zealous advocate of public schools in every part of the state.

His practical mind saw the waste of time in colleges in the studying of Latin and Greek languages, as he considered them neither necessary nor useful for a course of liberal education. He was severely criticized for this radical proposition; but he was only in advance of his time in recommending the modern eclectic,

scientific course at college. He opposed capital punishment, and advocated a change in the penal laws so that "punishment may be converted into ye means of reformation." He held advanced views upon the abolition of war and advocated a special peace officer for the United States. He also advocated the extension of the ballot to women.

During his whole life he was distinguished by a spirit of practical piety and a strict observance of the rites and ordinances of the Christian religion. How he was regarded as a teacher may be inferred from this pen portrait by one of his pupils, Professor Charles D. Meigs: "When, in the autumn of 1812, I first entered his lecture rooms in the old university building on 9th street, I was enrapt; his voice, sweeter than any flute, fell on my ears like droppings from a sanctuary, and the spectacle of his beautiful, radiant countenance, with his earnest, most sincere, most persuasive accents, sunk so deep into my heart that neither time nor change could eradicate them from where they are at this hour, freshly remembered. Oh! but he was a most charming gentleman! A 'grave and reverend and potent seigneur,' in the scholar class of mankind."*

His full length portrait in oil, painted by request of the students, adorns the library of the Pennsylvania Hospital. It was paid for very appropriately out of the fund created by the sale of tickets for the medical lectures, which had been donated to the hospital by the medical staff.

As remarked by the late Professor S. D. Gross, "Rush became a member of Congress in 1776 in order to sign the Declaration of Independence, whereas others signed it because they were members." He subsequently rendered valuable service to the Government in the capacity of Physician-General of the Military Hospitals of the Military Department of the Army. Truly, he was a great Patriot and Physician, as well as Psychiater!

A statue of Benjamin Rush was erected by the American medical profession, represented by the American Medical Association, with impressive ceremony, on June 11, 1904, in the city of Washington.

* History of Pennsylvania Hospital, by Morton and Woodbury. Revised Edition. Philadelphia, 1897, page 451.

REPORT OF A CASE OF CHOREA INSANIENS.*

By CARLYLE A. PORTEOUS, M. D.,

*Assistant Superintendent Protestant Hospital for the Insane,
Montreal, Canada.*

The following case of chorea insaniens I have deemed worthy of report before the Association, not because in itself it presents any markedly unusual features clinically, but because this type of case, although considered by Clouston as a separate disease entity, has received comparatively scant mention in the literature. Whether or not its rarity has to do with this apparent disinterest in study and paucity of report is problematical; (e. g., at Verdun Hospital with an average admission rate, embracing all varieties of insanity, of practically two hundred per year for the last eight years, only two cases have been received). It is a fact, however, that such authors as Paton, Peterson, White, Kraft-Ebbing and Kraepelin have, in their most recent editions, stated little that is new along pathological, clinical, or therapeutical lines in the consideration of this grave psychopathic condition. In the *Journal of Mental Science* from 1890 to 1912 but seven cases are reported or reviewed, although in 1909 and 1911 respectively able papers are mentioned as being contributed on the subject by Dr. C. W. Burr, Professor of Mental Diseases, University of Pennsylvania, Philadelphia, and Dr. Edward Mapother, Assistant Medical Officer, Long Grove Asylum, England. Both cases admitted to this hospital during the period referred to, terminated fatally, the first, a woman, æt. 26, after eight days residence, a case which suffered from an endocardial lesion, and in which was secured a history of acute rheumatism in youth. In the case reported in detail below it will be noted no history of rheumatic taint was found nor was there a demonstrable heart lesion.

This disease, in its extreme form, is a terrible one not only from its grave outlook, but from the symptoms manifested, which are distressing alike to the patient and to those interested in the case, the hallucinoses invariably being of a fearsome, disturbing nature and always accompanied by an objective motor restlessness painful to watch.

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

That it does not attack the ultra-degenerate seems a fair assumption, a résumé of such cases as could be come at, shewing a fair proportion to be among those in the twenties and a few in women who had passed through the stress of child-birth and its subsequent physical taxation without mishap; in other words, those who at all events had sufficient stamina to grow to maturity and functionate normally until assailed by this dread disorder. Search of the literature would seem to shew these statements are conservative, but the writer confesses that data on these points is all too meagre. That chorea insaniens will be superadded to chorea is by no means a foregone conclusion, but how best it may be guarded against and treated after development is the business of this Association.

Previous History.—E. K. H., female, æt. 30. Married six years ago, two children; nativity, English; resided in Canada for four years; laborer's wife; Anglican; common school education; no history of rheumatism or chorea elicited. This is reported to be first attack, with onset five days ago; began to talk confusedly; believed she was suffering from some obscure disease, and that her husband was insane; some evidence of visual hallucinations unpleasant in character; violent to nurse on one occasion; takes nourishment well; shows marked insomnia; general health hitherto good, though has complained of severe headaches at menstrual periods. Heredity: One paternal uncle committed suicide; definite history thereof unknown.

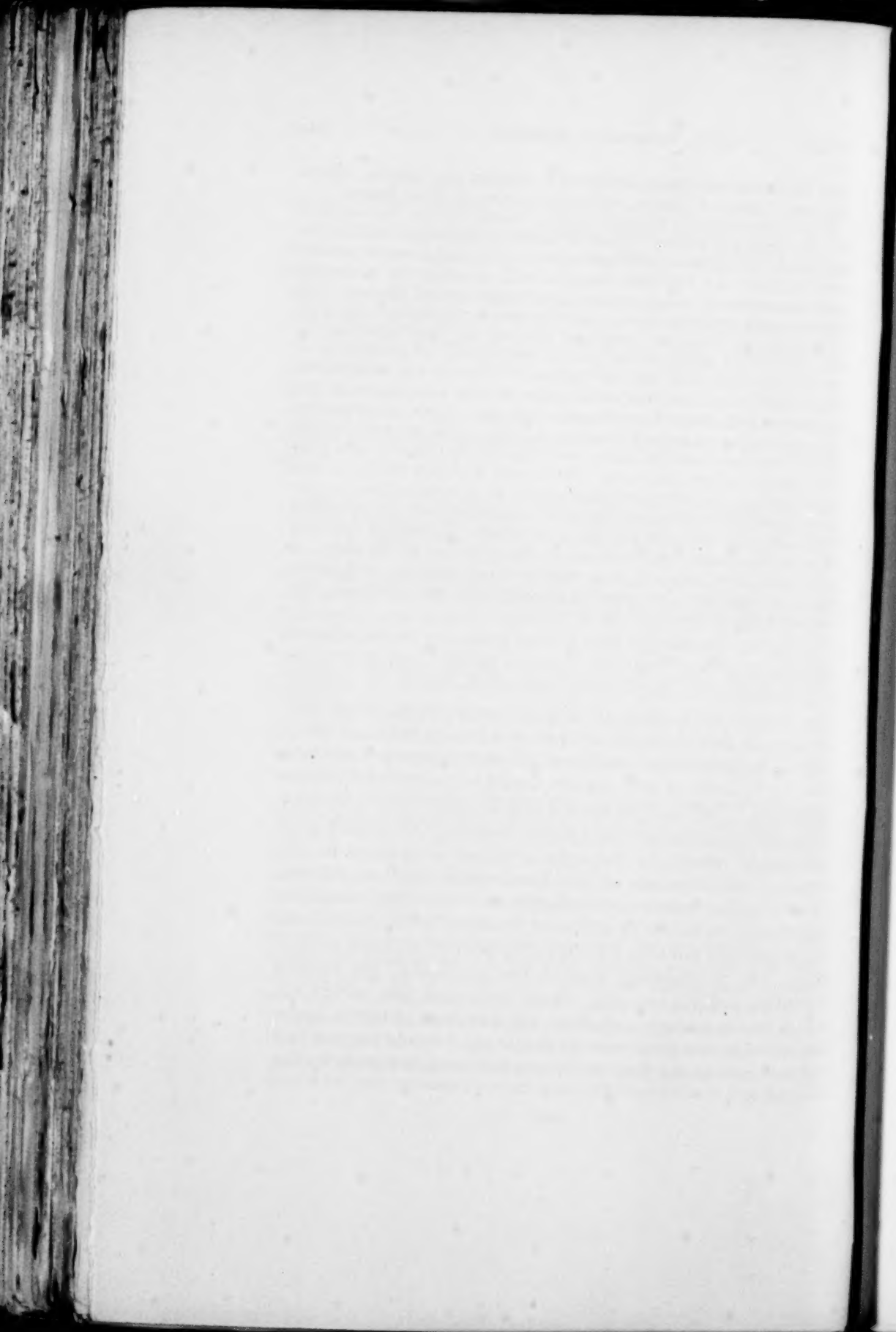
Admitted January 20, 1913.—Patient was noisy, calling out loudly; restless and resisted being moved; facies indicative of great fear; expression anxious; eyes staring; pupils slightly dilated; took nourishment in fair quantity after admission.

Physical Examination.—Temperature 99; pulse, 108; respiration, 24. Patient seems weak and shews involuntary movements of body, head, upper and lower limbs, the jactitation of the lower extremities being sufficiently severe to render any attempt at walking almost impossible. Nutrition is good but entire body covered with bruises, the result of patient's injuring herself in striking against bed during the choreiform movements; muscular tone somewhat relaxed; respiratory system normal; circulatory system normal; blood pressure 130; glandular system normal; abdomen on percussion and palpation normal; urine not examined as a sufficiently large specimen could not be obtained even by catheter, without using a general anæsthetic, which was not thought justifiable, owing to patient's restlessness; eye movements normal; no nystagmus; pupils dilated, react normally to light; could not elicit their reaction to accommodation; no tongue tremor; nasopharynx normal; intention tremor of arms apparent on attempt to put glass to her lips; muscular power of arms fair; hyperæsthesia demonstrated

when foot is touched, patient screaming in apparent pain; patellar reflexes increased; "Babinski" absent; ankle clonus present in slight degree.

Mental Examination.—Mentally patient showed marked disorientation for time, place and persons; failure of attention; accelerated ideation, but disturbance of idea association amounting to true incoherence is present; many delusions of a terrifying character exist, seemingly due to the constant elaboration of visual and tactile hallucinations and illusions. For example, when patient's attention could be temporarily engaged, she manifested complete inability to remember correctly any facts anent herself, the names of her nurses, or her present whereabouts; all attempts to fix her attention were futile and she was unable to retain any semblance of a goal idea. A constant flow of irrelevant phrases were spoken by her, interspersed with occasional exclamations indicative of fear; stated that her feet were snakes on seeing them protrude from under the bed-clothing; said she was enveloped in water; would cry out and seek to turn away when anyone entered the room. This mental condition continued until on January 26, the patient completely failed to externalize; her remarks became a mere muttering, and soon after coma supervened; death resulted forty-eight hours later and was due to exhaustion. Throughout the whole course of the disease involuntary spasmodic movements of the upper and lower limbs, head, and body were manifested and continued until patient was in extremis, even then occurring as slight occasional twitchings. Unfortunately no autopsy could be obtained.

To digress, the thought has occurred to me that the Association should make at least one such psychosis as this a matter of study by all members for each ensuing year or two years. In addition to a member being asked for a paper on a subject which likes him best, he should also be ordered to report on such a series of cases as the Association shall deem the more urgent or expedient. The precise form of such reports should be drawn up to ensure uniformity. The facts obtained would be based upon abundance of material, accurate returns by trained observers; thoroughly good pathological reports by the better equipped institutions in this respect to the advantage of their less favored brethren; therapy, with the useless culled and the useful retained. They should be published as an annual or a biennial brochure by the Association, which could not fail to be a work comprehensive, accurate, authoritative, and of advantage alike to the psychiatrist, the political economist, and the eugenicist. Were some such plan carried on, search for the etiology, pathology, and treatment of chorea insaniens would be rendered more profitable and I would suggest that this psychosis be the first one chosen for concerted study by the association.



SURGICAL PROCEDURES ON THE INSANE.*

By ARTHUR S. CHITTENDEN, M. D., BINGHAMTON, N. Y.

The studies of Sherrington, and more recently those of Eppinger and Hess, seem to make it clear that the central nervous system manifestations of visceral disease often may and must be profound. And if, as neuro-physiologists have amply demonstrated, the phenomenon of segmental overflow in the cord is so important both centrally and reflexly, it is not unreasonable to suppose that something analogous takes place in the higher centers as well. Reflections, such as the foregoing, have led the writer, through the courtesy of Dr. Charles G. Wagner, to undertake a limited investigation of surgical conditions as they exist in the patients of the Binghamton State Hospital. It might be said that this has been done with no preconceived ideas of relationship between psychoses and the coexisting surgical conditions, nor has it been followed by any warrantable deductions as regards associated relief of the psychoses. Neither has the investigation been conducted with any special view to those psychoses classically associated with brain tumor, abscess, trauma, thyroid or tabes; merely a study of surgical conditions coexistent with insanity.

There are in the Binghamton State Hospital about 2400 patients. Among these are 254 patients with surgical conditions. Of this number about 200 are debarred by their surgical infirmities from occupational or special therapy. This fact seems to me to be an important one, since these patients combat, not only the surgical disability itself, but are also deprived of important therapeutic advantages.

Several surgical lesions frequently coexisting in the same patient makes classification complicated, and I will not detain you with statistics. Of the various surgical conditions, hernia leads the list in 78 patients, hemorrhoids in 32, varicose veins in 25, hydrocele (large) in 10, ankylosed joints in 14, lipomata in 7, prolapsed rectum in 7, prolapsed uterus in 5, uterine fibroids in 3, malignant neoplasms in 9, etc. None of these lesions are of the

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

special senses and can therefore have little or no effect upon hallucinatory states. They do, however, preponderate markedly in cases of the functional psychoses and in the constitutionally inferior. These types of cases, I am informed, are of the greatest economic value to the state from the standpoint of labor. Varicose veins, herniæ of the abdominal wall and flat feet occur more frequently in the so-called constitutionally inferior than in any other type. This is interesting in connection with studies recently made by Vogel upon patients with "constitutionally inferior connective tissue." Many of the herniæ cases are cardio-nephritics as well and it is well to bear in mind the association of an inferior central nervous system with the loss of muscle tone and generally diminished yellow elastic fibers in the fasciæ, ligaments and cardio-vascular system. Surgical lesions, as bearing upon the infective-exhaustive conditions, were few and included chronic osteomyelitis and, of course, cancer.

Many of the surgical patients are aged, have been disabled many years, and are inoperable; in very many, however, the condition is remediable.

In our experience the ordinary operative procedures as carried out in insane patients are not as a rule more formidable or attended with more difficulty than under normal mental conditions.

The chief practical problems which immediately present themselves are those of anæsthesia and after care. For purposes of anæsthesia and especially in patients over forty years of age, we have been led to rely almost entirely upon drug narcosis. This requires usually but one hypodermic injection. We use a combination of scopolamine and morphine. Scopolamine differs distinctly from hyoscin in that it is much less toxic and produces, when reinforced with morphine, a profound euphoric tranquillity. In excessive dosage, however, it acts as a deliriant and the appearance of such a condition is an indication for more morphine.

Our patients are given 1/100 grain hypo of scopolamine with 1/4 grain morphine one hour before operation and then left undisturbed. At the end of this time they can be easily aroused but are indifferent to their surroundings and usually fall asleep when placed on the operating table. The operative field is then blocked off by injecting 1/4 per cent solution of novocain or a solution of the hydrochlorate of quinine and urea; the operation then

proceeds. An observer at the patient's head closely watches the respiration and pulse. This form of anæsthesia is especially safe and efficient in the aged, in high tension cases and in cardio-nephritikers. These patients awake very slowly if undisturbed, their tranquillity continuing for 24 hours or more. This state can be prolonged if desired by additional small doses of morphine and the patients frequently do not realize that any thing unusual has occurred. If the field of operation be one of unusual sensitiveness or the patient one of marked irritability, prolonged local after-anæsthesia can be obtained for two to four days by blocking the field at the time of operation with hydrochlorate of quinine and urea instead of novocain. Persons younger than 40 years do not bear scopolamine well. In such individuals the drug acts as an excitant and produces an undesirable fall in blood pressure. If used at all in young persons, scopolamine should be given in small dosage, 1/200 grain, with morphine sulphate grain $\frac{1}{4}$ and repeated; or, better, morphine alone followed by ether.

Plaster of Paris dressings, properly applied, will remove if necessary any question of the patients disturbing the bandages. A Gigli saw placed beneath the plaster which is therewith cut through immediately as it is applied makes the operative field always accessible and yet amply protected. In but one instance have we found it advisable to employ the camisole.

It is especially to the safety and simplicity of the methods outlined that I invite your attention.

Up to the present we have had no infection and no fatalities; the ages of our patients have ranged from 25 to 70. Our operative experience, employing the foregoing methods, is limited to but eighteen. The types of insanity represented in our cases include dementia præcox, acute mania, recurrent mania, manic depressive and paranoid conditions.

Among the surgical conditions involved were inguinal herniæ (single and double) osteomyelitis, large lipomata of various regions, cancer of the parotid, extensive tuberculosis of axillary glands, tuberculosis of the testicle, etc.

Our experience, as far as it goes, leads us to feel that insane patients are not, by virtue of their mental conditions, bad risks or especially difficult in the matter of after treatment.

We are now trying to correct all operable conditions at admission, at the same time slowly reducing the number of cases which have been accumulating during many years. We believe at present, since operable procedures upon the insane have been reasonably simple and safe in our experience, that we are warranted in our efforts in this direction because—

(1) The patients are thereby able to enjoy occupational and other special therapy;

(2) Their economic value to the state is increased; and

(3) They are relieved of certain peripheral disturbances whose importance is undeterminable. If a sound mind in a sound body is a reasonable postulate, then surely correction in cases of the insane of coexistent surgical conditions would seem to be warrantable, especially if the undertaking presents no unusual risks.

ANNUAL ADDRESS.*

By EDWARD RYAN, M. D.,

Superintendent, Rockwood Hospital for the Insane, Kingston, Ontario.

It is my pleasant duty to extend a word of welcome to you to-night.

Some men are born to honors, some achieve them, some have them thrust upon them; in this particular case I may say the honor was thrust. No one can regret more than I the loss to the meeting caused by the fact that the Hon. W. J. Hanna has found it impossible to deliver this annual address. He has deeply at heart the progress and advancement of the hospitals for the insane, and his one desire is to give to the country the very best hospital service.

It is a pleasure to be able to state that psychiatry has made considerable advance in Ontario in recent years. In all respects the conditions surrounding the hospital life of the patients have been vastly improved. The training school and the trained nurse have contributed largely to the breaking down of the mystery and aversion surrounding the hospitals for the insane.

Under the more modern methods of treatment the results have been so satisfactory that the public begin to recognize that for the insane all is not lost, nor need hope be abandoned. The closer union, too, with medical centers; the fact that many hospitals for the insane are now an integral part of university life has contributed largely to the dissemination of a knowledge of psychiatry among the general practitioners and through them to the public. This spread of knowledge has influenced in more than one direction. It has directed public attention to the hospital. As a result we have a more intelligent class of nurses, a more zealous type of official, a modern therapeutic equipment, an earlier admission of the patient, and an all-around higher and more enthusiastic medical life.

Psychiatry has therefore made marked advances during recent years along clinical and therapeutic lines. The labor and devotion of a splendid band of faithful disciples has cleared the air of the

* Read at the sixty-ninth annual meeting of the American Medico-Psychological Association, Niagara Falls, Canada, June 10-13, 1913.

mysticism and doubt which so long enshrouded this great department of medicine. Psychiatry, we may say, had its birth in the humanitarian labors of Chiarugi and Pinel. With a professional and chivalrous courage they broke the chains that held the sufferer in his prison cell, and that bound the science to the dismal traditions of the past. The labors of Connolly and Tuke in England marked a still further step in this civil advance. Then came the earnest endeavors by many workers in many fields, to establish psychiatry as an exact study, on a scientific basis; to regard it as a purely medical or as a psycho-medical science, governed by well recognized laws, and capable of exact interpretation. This view reached its highest in the studies, the writings and the system of Kraepelin.

It is worthy of notice also that side by side with the progress of our knowledge of mental diseases there developed a series of cognate subjects, born of the family, and requiring in their determination a study and a treatment as profound and as scientific.

There is the vast array of social questions, the care and treatment of the inebriate, the feeble-minded, the degenerate, the social outcast, the social plague. These grave questions are now receiving a study and attention, social, scientific and national, that will in the end result in the greatest good to humanity.

I am glad to be able to say before this Association to-night that nowhere has the result of this diverse movement been more in evidence, or reached a higher place, than in the Province of Ontario.

The Hon. W. J. Hanna is the pioneer in this social and prison reform. His labors and his results mark a new history in the world's conception and treatment of disease, degeneracy and crime.

As the subject of psychiatry and allied subjects in all their beauty unfold themselves before us, we are struck by the fact that the development has been mainly along clinical lines; that it has concerned itself chiefly with the interpretation of psychic phenomena. Individual cases have been submitted to an exhaustive study, and a classification highly scientific has been the result.

From the therapeutic side much advance also has been made, and yet one cannot but be struck by the hopeless and mournful note everywhere given forth in connection with the treatment and

cure of the psychoses. Now in all sincerity I beg to say to the members of this Association that I consider the time has arrived when those charged with the direction of this great branch of medical science should bring this work in closer touch with university life, and, above all, with modern laboratory work, with the highest, the most exact, the most diligent research investigation.

I speak for the organic union of psychiatry with medicine, through the medium of the university and the laboratory. I am led to this point of view, to the absolute necessity of this departure, from the study of the history of medicine in other branches, and from experience gleaned at Rockwood Hospital during the past seven years.

Through many centuries the study of medicine was confined pretty generally to the study of individual types, and to the classification of the knowledge derived from these observations. In this connection it is most interesting, and for my present argument most suggestive, to turn to the writings of the great father of medicine, and to observe the rare and accurate knowledge of the most intricate human affections possessed by Hippocrates in those far-off days of Athenian glory.

His etiological and clinical description of the great plague has not been excelled in lucidity or accuracy by any writer up to the present time. The same remark can be made with reference to his work on fevers. May I also venture to say that we have made little advance on his therapeutics, because for tertian and quartan fever (malaria) he recommends the filings of steel and the chewing of a foreign bark. There is, however, a marked absence as to treatment in all his writings.

Lucid, too, is his description of epilepsy, or the Sacred Disease, as it was called, but Hippocrates naively remarks it is "no more a divine disease than any other, but has its seat in the brain, which is the organ of the senses and of the intellect, and that it is due to a cold phlegm or pituita secreted by that organ." His description of an epileptic seizure is not surpassed in clearness or thoroughness by any modern writer. "The man loses his speech and his intellect, the hands become powerless and contracted, the blood stopping and not being diffused, the eyes are distorted, froth from the lungs issues by the mouth, he foams and sputters like a

dying person, the bowels are evacuated, the patient kicks with his feet."

From the clinical side I am not sure that any modern writer exhibits in any way a wider or clearer knowledge of smallpox, scarlet fever or chorea, than that possessed by the great Sydenham. What strikes one, too, is the accuracy of description, the terseness of language, the rare power of marshaling facts, possessed by those immortals of medicine.

Now modern science is wonderfully more diverse than the science left us by Hippocrates and Sydenham. There is, too, a far-away cry from the psychiatry of Kraepelin to the psychiatry of Pinel; but let me draw your attention to the fact that plague was master of the situation till Kitasato made his wonderful discovery. Let me point out to you how little was added to our knowledge of malaria from the days of Hippocrates till Lavan's plasmodium was brought to light, until Manson found the storehouse of malaria poison in the stomach of the *Anopheles*. Yellow fever continued its devastating sway till Camp Lazear was crowned with the flag of victory.

Here we have a group of affections that depopulated cities, laid waste great areas even on this continent, that turned the tide of commerce, that sealed as with seven seals vast regions of Africa and America, and yet they have been conquered, robbed of their terror, and soon will be regarded as historical relics of a forgotten past.

Of what avail was our knowledge of cerebro-spinal meningitis, of anterior poliomyelitis, diseases rather closely associated with our own work, till Flexner's lamp showed us the light. Death, and deformity sometimes even worse than death, were the fertile product of these diseases, but the genius of Flexner has discovered the cause and the remedy. There is nothing in the history of the world in song or fable so wonderful as the story of modern medicine. Why even syphilis, mystery of mysteries, is shorn of its historical secret. But the story would never have been told were it not for the devoted zeal of the toiler in the field of original research. The clinician could advance to a certain point, and then he read "thus far shalt thou go and no farther"; the journey was completed in the great silence of the laboratory.

Now what part is psychiatry playing in this renaissance of

medicine? As I have before mentioned, in clinical methods and therapeutics psychiatry has more than made good; but epilepsy is no more understood now than it was in the time of Hippocrates.

I speak with profound respect, and in no critical spirit, when I say that to my mind there is a wonderful lack of the spirit of laboratory research in the world of psychiatry to-day. I make a plea here to-night for an awakening to vigorous and continued effort along this line. I am aware that the answer will be "love's labor lost." Is this answer satisfactory—is it correct? Lugaro in 1909 makes this statement: "We know for example that syphilis is the remote cause of general paralysis of the insane, but when the disease makes its appearance there is no longer any trace of the active syphilis, and anti-syphilitic treatment is utterly useless." While this great teacher was writing out this statement Noguchi was already preparing the decisive answer. The pity of it all is the answer did not come from a hospital for psychiatry.

Not only has it been demonstrated by Noguchi that in paresis the living spirochætæ prey upon the cerebral cells, but others have shown that the brain cells can be reached for treatment through the cerebro-spinal fluid. This method of treatment has met with marked success in cerebro-spinal meningitis and in anterior poliomyelitis.

Experiments at Rockwood have shown that methylene blue injected into the spinal canal of rabbits is found within twenty-four hours in all parts of the cerebral tissue. How far can this principle of cerebral investigation and cerebral medication be carried, or can it be applied at all? It has already been successfully applied in general paresis, and to other diseases I have mentioned; why can it not be applied to the various psychoses?

Take, for example, dementia præcox. This disease in the main claims its victims at an early period, the most vigorous, fruitful period of human life. The subject may be a product of faulty heredity; he may have exhibited a certain precociousness or unstable nervous mechanism, but at the same time he is quite capable of reaching a creditable if not a high place in educational or industrial life. Now the faulty heredity, the unstable nervous organism, is the soil, it is true, but whence comes the seed? Can this source be reached or can the seed be destroyed before it takes root? We know from post mortem investigations that in dementia

præcox there are certain lesions of the cerebral tissues. What causes these lesions? Can well-organized and long-continued investigation throw any light on this terrible scourge? Is the end not worth the effort? And where, let me ask, can this effort be made with the best hopes of success? It is for the hospitals for psychiatry to lead the way.

What have we to offer with respect to manic depressive insanity? Of the various types and of the essential characteristics of each type we can speak in exact language and with a scientific clinical knowledge. We are also able, after careful observation, more or less prolonged, to give a fairly exact prognosis. But what have we gathered with respect to the causation of this disease? In this disease there may or there may not be a faulty heredity, and the patient's life may have been quite exempt from previous neurotic or psychic conditions.

But what is the exciting cause? Is it purely and solely psychic, or is it associated in any way with a toxic condition? Is the primary cause mental, and does this causative factor act in any way on the susceptible, responsive, sympathetic system, paralyzing its inhibitive action, and allowing the intestinal toxins to pour into the open lymphatic system; and do these toxins find a suitable habitation in the highly organized cerebral cells? Surely we would be well advised in going beyond what manic depression really is and endeavor by all available means to seek the source from whence it came.

Now I wish to draw your attention to another, and in my experience an ever-increasing group of affections, to which we have given the name "Insanity due to the various toxæmias." When I mention an ever-increasing group, I am free to admit our trend of mind may lead us to unduly enlarge a classification. In this group there may or there may not be a defective heredity, or a previous neurotic history.

This group, in the course of the disease, exhibits all the symptoms of a profound toxæmia, the coated tongue, the foul breath, an increased pulse, and in many cases a rise of temperature. Skin eruptions and superficial abscesses make their appearance, showing nature's attempt to discharge the poison. We are responsible for the nomenclature, but what have we done to dis-

cover the nature of the toxines, or the fountain from which they spring?

What success has attended our efforts with the psychoses which may be placed to the vagaries of the thyroid gland? Different views have obtained at different periods. The secretion was too copious; it was deficient; it was depraved. The thyroid was atrophied and we gave thyroid extract, or we grafted sections of thyroid gland obtained elsewhere. The gland was hypertrophied and so we extirpated the gland, or a single lobe, or a section of a lobe.

We wiggled in and wiggled out
And left the world all in doubt
Whether the snake that made the track
Was going in or coming back.

Cannot the same be said of many of the ductless glands whose functions are little known to us at present? What part do they play in the human mechanism?

Hippocrates taught that madness is due to a phlegm secreted by the pituitary body. We may yet learn that the great teacher spoke, if not with an actual knowledge, at all events with a prophetic vision.

Now for the reasons given I have satisfied myself at all events as to the urgent necessity of a well-organized, well-sustained system of research investigation in connection with the hospitals for mental diseases. Let me again quote from Lugaro: "The alienist must take an active part in the work of developing in neighboring fields of research; cultivate other sciences in order to help the progress of his own. The mere study of psychology, of disease of the mind, to which psychiatry should be reduced according to some, is a necessary study, but by itself ineffectual and sterile."

For generations we have busied ourselves with discussion after discussion on the nature of general paresis, and yet, while useful, how barren it all seems in comparison to what the last few years have brought forth through the medium of the laboratory.

I am not unmindful of the splendid work already performed by Alzheimer, Mott and Robertson, nor of the valuable contributions made by many zealous laborers on this continent, but I consider the work should be more general, more widespread; that it should exhibit a greater continuity; that every hospital for the insane

should have a well-equipped laboratory and skilled, experienced investigators. There are difficulties in the way, financial difficulties and possibly a dearth of skilled operators; but if we who are in charge take seriously to this great advance I have no fear of the issue. True, success may not be to-morrow, but I venture to say that no year will pass without adding greatly to our store of knowledge.

I have one more plea to offer, and that is, that we make an earnest endeavor to bring our hospitals into closer touch with university life. It is a fact that in the vast majority of instances the medical graduate of to-day possesses no real knowledge of psychiatry; he can expound clearly as to the "opsonic index" and the "deviation of the complement," but of the elementary principles of psychiatry he is absolutely ignorant; and going forth from his university without any appreciation of this great branch of medicine, he never acquires a taste for this study. He is quite unable to recognize the incipient stages of the various psychoses, and the case drifts on until the disease is fixed, and a life is lost.

We speak of psychiatry as a department of medicine, and yet many of the famous universities on this continent entirely ignore this subject. It finds no place in their curricula. Surely this lamentable condition should exist no longer, and the various educational bodies should see to it that this subject has a place commensurate with its importance in the life of every university. I speak from experience when I say that medical students value most highly a course in psychiatry, and that the presence of this educational influence exerts an elevating tendency on the whole hospital life.

To me these views appeal with ever-increasing force; for with a profession well educated in the practice of psychiatry, and with an enthusiastic army of investigators, may it not be that sorrow and distress may be relieved; that society and the state may be shorn of an ever-increasing burthen of human suffering and woe; that what is dark may be illumined, and that what is hidden from our view may be brought to light.

We see but dimly through the mists and vapors
Around these earthly damps;
What seem to us but sad funereal tapers
May be Heaven's distant lamps.

Notes and Comment.

ADMISSION OR COMMITMENT OF MENTAL CASES TO HOSPITALS FOR TREATMENTS.—The greatest obstacle to the speedy admission of mental cases to hospitals properly equipped and organized for their treatment is found today in the survival of the old theory, largely discarded by alienists, that the only excuse for such admission is to be found in the irresponsibility of the patient because of his mental infirmity. An examination of the statutes in the United States and Canada shows that the phrase occurs repeatedly that admission cannot be granted until a certificate is given by the medical attendants that the patient is a source of "danger to the public or to himself" and the inference is that considerations of public or personal safety alone justify an order from a court that he be committed to a place of safe-keeping. This makes public the fact that the patient is irresponsible and requires restraint or seclusion. In a number of states this condition with its inevitable stigma upon the individual is sought to be avoided by his admission as a voluntary patient. In too many instances, however, the privilege of voluntary entrance has been hedged about with inconsistent, not to say foolish, conditions which render the privilege of little avail. In one state the patient must not be insane; in another he must not be a pauper, and in a third he can only be admitted when the quota of the county is not filled or when five other voluntary patients are already under treatment; and if admitted he may not remain more than sixty days. In two states where the privilege exists the practice of thus admitting patients is systematically discouraged by the authorities, doubtless as a way of escape from possible legal complications under an inadequate statute.

Still the fact that the privilege is exercised at all is an evidence of the need of a provision for voluntary admission in the laws of every state.

In the minds of the majority of alienists the opinion is now firmly established that the word "commitment" as applied to the

process of placing a patient under treatment in a proper hospital should be given up and the word "admission" should take its place. They believe that insanity is a disease or a condition to be ascertained and treated like any other bodily disorder, and that the arm of the law ought not to be resorted to except in extreme cases, that is, in cases where there is actual danger from mental irresponsibility.

In Minnesota a provision of law exists which seems a movement in the right direction. It provides that a detention hospital in connection with state hospitals shall be established to which a state hospital commission consisting of three persons, one of whom is to be a duly qualified physician, appointed by the judge or judges of the district court of the county, may send a patient under the same restrictions that govern voluntary commitments.

The need of psychopathic wards in connection with general hospitals is becoming generally recognized if we would secure prompt treatment for recent cases or provide measures of prevention in the incipient stages of insanity.

A recent article from Dr. W. A. White of the Government Hospital in the March number of "*The Modern Hospital*" is most illuminating in its treatment of the whole matter and is to be commended to the careful attention of all alienists.

The time seems ripe for an effort in connection with the Society of Mental Hygiene to urge the establishment of such hospitals in every large city and medical centre.

THE SEVENTIETH ANNUAL MEETING OF THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION.—The Seventieth Annual Meeting of the American Medico-Psychological Association, which is to be held in Baltimore May 26 to 29, 1914, promises to be one of the most interesting and successful in the history of the Association.

The oldest national, or in view of the fact that its membership includes the medico-psychologists of what has been called Greater Britain, Canada, shall we say International Association, on the western hemisphere, its record has been a noteworthy and enviable one among scientific bodies. No one can read its proceedings, as recorded from the first in the pages of this JOURNAL, without a strong realization of the force which it has exerted in

promoting the welfare of the insane, and encouraging the scientific study of psychiatry. Commencing with the original thirteen who met in Philadelphia, seventy years ago, its membership has included the leaders in psychiatric study and practice in the United States and Canada, and many of the papers which have been presented at its meetings have marked distinct epochs in the progress of scientific medicine.

The Association has never lent itself to self-exploitation and outside the volumes of its Transactions or the pages of the JOURNAL has not been widely known except to workers in its own field. The force of its influence has nevertheless been felt all over the land and felt for good.

The preliminary programme for the meeting in Baltimore presents an extended and interesting array of titles and we understand that since it was issued several additional papers have been offered.

The first session of the meeting will be opened at ten a.m. May 26, by an invocation by Cardinal Gibbons, to be followed by addresses of welcome by the Governor of the State and the Mayor of Baltimore. After the reports of various committees and the editors of the AMERICAN JOURNAL OF INSANITY, and the reading of memorial notices of deceased members, the President, Dr. Carlos F. MacDonald of New York, will deliver his address.

A symposium on General Paralysis has been arranged to be opened by the following papers, the discussion of which will be opened by Dr. H. W. Mitchell of Warren, Penna.:

"General Paralysis as a Public Health Problem," Thomas W. Salmon, M. D., New York, N. Y.

"The Pathological Anatomy in General Paralysis," Charles B. Dunlap, M. D., New York, N. Y.

"The Diagnosis of General Paralysis," Adolf Meyer, M. D., Baltimore, Md.

"The Treatment of General Paralysis," Henry A. Cotton, M. D., Trenton, N. J.

On Tuesday afternoon the ladies accompanying the members of the Association will be given an automobile ride and entertained by the Baltimore ladies' committee at the Baltimore Country Club.

In view of the fact that the order of reading of reports and papers as announced in the preliminary programme will probably be changed in some instances we reproduce here the titles from

the programme which has been sent out by the Secretary without reference to the order of their presentation:

Report of Committee on Statistics, Thomas W. Salmon, M. D., New York, N. Y. (Chairman).

"Is There an Increase Among the Dementing Psychoses?" C. P. Bancroft, M. D., Concord, N. H.

"What Is Paranoia?" E. Stanley Abbot, M. D., Waverley, Mass.

"The Mentality of Prostitutes," Walter E. Fernald, M. D., Waverley, Mass. Report of Council on time and place of next meeting.

Report of Committee on Immigration, Edward N. Brush, M. D., Towson, Md. (Chairman).

"The Medical Examination of Mentally Defective Aliens; Its Scope and Limitations," Surgeon L. L. Williams, in charge of the U. S. Immigration Station, Ellis Island, N. Y. (By invitation.)

"The Modern Treatment of Inebriety," Irwin H. Neff, M. D., Foxborough, Mass.

"Pupillary Anomalies Associated with Mental Disorders," Francis M. Barnes, Jr., M. D., St. Louis, Mo.

"Report of Case Cerebellum Tumor with Pathological Findings," W. M. English, M. D., Hamilton, Ont.

Report of Committee on Psychology in the Medical Schools, E. Stanley Abbott, M. D., Waverley, Mass. (Chairman).

"Scientific Efficiency in Psychiatry," Owen Copp, M. D., Philadelphia, Pa.

"Clinical Studies of Benign Psychoses," August Hoch, M. D., New York, N. Y.; George H. Kirby, M. D., New York, N. Y.

"A Criticism of Psychoanalysis," Charles W. Burr, M. D., Philadelphia, Pa. (Discussion to be opened by Francis X. Dercum, M. D., Philadelphia, Pa., by invitation.)

"Some Notes on Expert Testimony by Alienists and Neurologists," Carlyle A. Porteous, M. D., Montreal, Que.; Hedley V. Robinson, M. D., Montreal, Que.

"The Establishment of Training Schools for Attendants (now nurses) in Asylums (now hospitals) for the Insane at McLean Hospital and Buffalo State Hospital. 1882-1886." By William D. Granger, M. D., New York.

SYMPOSIUM: Eugenics, Wm. Mahon, M. D., New York, N. Y. (Chairman).

"Legislation in Reference to Sterilization," Hubert Work, M. D., Pueblo, Colo.

"Assuming That Tendencies May Be Transmitted, What Should Be the Attitude of the Medical Profession on the Subject of Eugenics?" Sanger Brown, M. D., Kenilworth, Ill.

"Some Aspects of the Problem of Mental Deficiency," Max G. Schlapp, M. D., New York, N. Y.

Report of Committee on Diversional Occupation of the Insane, Wm. Rush Dunton, Jr., M. D., Towson, Md. (Chairman).

"Report of Case of Paresis with Associated Stokes-Adams' Syndrome," Frank P. Norbury, M. D., Springfield, Ill.

- "Insanity with Cerebral Disease," H. P. Sights, M. D., Hopkinsville, Ky.
"The Translation of Symptoms into Their Mechanism," Chester L. Carlisle, M. D., Kings Park, N. Y.
"Epileptic Dementia," Alfred Gordon, M. D., Philadelphia, Pa.
"Insanities in Children," John H. W. Rhein, M. D., Philadelphia, Pa.
"Some Remarks Upon the Methods and Results of Study of the Psychopathies of Children," L. Pierce Clark, M. D., New York, N. Y.

On Wednesday afternoon, May 27, the Association will be given a trip down the Chesapeake Bay and in the evening the Annual Address will be delivered in Osler Hall in the building of the Medical and Chirurgical Faculty of Maryland by Lewellys F. Barker, M. D., Professor of Medicine in the Medical School of the Johns Hopkins University, subject, The Relation of Internal Medicine to Psychiatry. This will be followed by a smoker and cabaret at the Hotel Belvedere.

On Thursday afternoon a reception will be given at the Henry Phipps Psychiatric Clinic of the Johns Hopkins Hospital, followed by a session of the Association in the lecture room of the Clinic. On Friday afternoon a reception will be given the members of the Association and ladies at the Sheppard and Enoch Pratt Hospital. In the evening a special Benjamin Rush meeting will be held in Osler Hall, when an illustrated talk will be given on the life and work of Benjamin Rush.

The headquarters of the Association will be at the Hotel Belvedere and the morning and afternoon sessions, with the exception of the one at the Phipps Clinic, will be held there. The evening sessions will be held at Osler Hall, which is but a short distance from the hotel.

The exhibits illustrating diversional occupation and hospital architecture will be in the ball-room of the hotel on the same floor with banquet room where the meetings of the Association take place.

The editors of the JOURNAL hope that all papers and reports presented will be in complete form and at once placed in the hands of the Secretary. Attention is called to the desirability of having all manuscript in condition for printing. The editors sometimes find it necessary to edit manuscript which should have been revised by the authors before presentation, and not infrequently authors revise their productions in proof reading to such an extent as to cause a by-no-means inconsiderable expense in

making changes in type. If authors will exercise care in the final reading of manuscript before its presentation they will spare the editors an unpleasant duty and save the JOURNAL considerable expense.

On Monday, May 25, the National Committee for Mental Hygiene will meet in Baltimore, with eight state societies represented. The first session will be at 11 a. m. At 2 p. m. there will be a round-table discussion and at 8 p. m. addresses by Dr. William H. Welch, Senator McLean of Connecticut and Miss Julia Lathrop.

The Association for the Study of the Feeble Minded and the National Association for the Study of Epilepsy meet in Baltimore on the same date.

INTERNATIONAL CONGRESS OF NEUROLOGY, PSYCHIATRY AND PSYCHOLOGY.—The Swiss Society of Neurology, in connection with the Society of Psychiatrists of Switzerland, have undertaken, at the suggestion of the Holland Committee which organized the International Congress at Amsterdam in 1907, to organize another International Congress, to be held in Berne, from September 7 to the 12th, 1914.

The President of the Swiss Confederation has been named as the Honorary President and a Committee of Organization has been chosen, with Prof. Paul Dubois, of Berne, as President.

In the preliminary circular it is stated that in subsequent circulars more definite information will be given concerning the details of the Congress and the various attractions which will be offered; particulars also will be forthcoming as to the means of reaching Berne, the accommodations to be found by visitors, etc.

During 1914 a Swiss National Exposition will be held in Berne, which will present to members of the Congress many features of interest.

The Secretary of the Congress is Monsieur le Dr. L. Schnyder, 31 Rue Monbijou, Berne, Switzerland.

Book Reviews.

A Thousand Books for the Hospital Library. Selected from the shelf-list of the Library of McLean Hospital, Waverley, Massachusetts, by EDITH KATHLEEN JONES, Librarian. With additions and annotations by MIRIAM E. CAREY, Supervisor of Institution Libraries, Minnesota State Board of Control; FLORENCE WAUGH, Librarian for State Institutions, Nebraska Library Commission, and JULIA A. ROBINSON, Secretary, Iowa Library Commission. (Chicago: American Library Association Publishing Board, 1913.)

Anyone who has ever tried to select books for hospital use can appreciate how valuable this list may prove. The McLean Hospital has one of the oldest patients' libraries in this country, where Miss Jones has had considerable service and has been able to profit by the experience of her predecessors who have weeded out undesirable books and by their records have shown the most popular and most desirable. Miss Jones's work has also been criticized and augmented by her collaborators. An excellent foreword indicates the principles which have guided the selection of this list and will be helpful to anyone having charge of a library. We believe that no hospital should be without this list, as it is a most valuable guide for the selection of books for patients' use. Every institution should have a library even though it has no trained librarian, and this list will prevent the purchase or accumulation of unsuitable books. The comments on the books are especially valuable to the untrained librarian or person in charge of the books which form the nucleus of a library.

W. R. D.

The Modern Treatment of Nervous and Mental Diseases. By American and British Authors. Edited by WILLIAM A. WHITE, M. D., Superintendent of the Government Hospital for the Insane, Washington, D. C., etc., and SMITH ELY JELLIFFE, A. M., M. D., Ph. D., etc. In two volumes. (Philadelphia and New York: Lea & Febiger, 1913.)

We are told in the preface that "these volumes, devoted to the treatment of nervous and mental diseases, are designed to meet the needs which the rapid advances in the knowledge of neurology and psychiatry have created. The nervous system is here regarded as a whole and as inclusive of the mind, and it is maintained that disturbances of any and all of its functions, mental as well as physical, are proper subjects for therapeutics . . ." The present work lays emphasis upon the psychical side of life as being worth quite as much consideration as the physical. It sets forth doctrines of nervous and mental hygiene, reconstructive factors in social organization

as applied to human ills, and endeavors to present a broad front to the pessimistic nihilism in therapeutics that has been too long current in these fields, because the doctors' eyes have been too closely focussed on the individual examples and result of human accidents."

Such a prediction concerning a work the product of a single author, might, if the author were fortunate, be made without fear as to the result, but when made concerning an encyclopædic work of two volumes each of more than 800 pages, the production of thirty-six different authors, there would appear to be some danger that here and there would appear breaks in the broad front.

To review a work of this character, in such a manner as its character and real worth deserves, would take more time and space than can now be devoted to the task. On a future occasion it may be found profitable as well as interesting to select some of the monographs, for such most of the contributions to this work really are, for more extended notice or criticism.

It would be inevitable in such a large collection of contributions that there should be a degree of inequality in the character of the work, but this is not a serious fault when the work is taken as a whole. The smaller faults of omission, of too great stress upon matters which to the individual contributor have seemed paramount, but which in a broader grasp would have been but lightly touched upon, are lost sight of in the general excellence of the whole.

The contents of the first volume will be perhaps of greater interest to the psychiatrist, as it contains chapters or sections dealing more particularly with matters psychiatric. The volume opens with an introduction in which the editors outline the scope and intention of the volume. They take the position throughout "that the word 'insanity' should be eliminated from a twentieth century work on medicine. It is a relic of that time when all brain disorders, with predominant mental symptoms, were considered as one disease. It has no place in the present order of things—certainly not in medicine, and probably better not in law."

Why the word probably? If there is no use of the word insanity from a medical standpoint, certainly none exists in law; if medicine can explain what the law wishes to determine without use of the word—and if medicine cannot, then the word has a place in medicine as much as in law.

The editors speak of the time "when brain disorders with predominant mental symptoms were considered as one disease." We thought we had long ago agreed to consider the symptoms of various brain and other disorders when those symptoms were mental, as symptoms and only symptoms, showing themselves in various ways not as the result of one disease, and not always, by any means, of disease of the brain.

Nothing new is announced in the statement of the editors and we doubt very much if we shall for a long time hear the last of the term insanity, or of other terms which those who seem to have a fear of words have substituted for it, but which after all mean the same thing. Nor do we conceive that any one using the word as it is by common consent used in

medicine will be charged with intending to be understood as speaking of an entity. No author of a treatise on insanity, in recent years at least, has ever claimed, or suspected that he was in danger of being charged with claiming, that under this somewhat condensed title he was putting forth a treatise on one condition "insanity."

Following the introduction come chapters upon Eugenics and Heredity in Mental Diseases; Education; Sexual Problems, Their Nervous and Mental Relations; The Educational Treatment of the Feeble-minded; Delinquency and Crime in Relation to Mental Defect and Disorder; Immigration and the Mixture of Races in Relation to the Mental Health of the Nation; Alcoholism and the Alcoholic Psychoses; The Treatment of the Neuroses, Including the Psychoneuroses; Traumatic Neuroses and Psychoses; Occupation Neuroses; Disturbances of the Internal Secretions—Sympathetic System Disorders; Mental Diseases of Somatic but Extraneous Origin (Symptomatic Psychoses); The Manic-Depressive Psychoses and their Treatment; The Treatment of Dementia Præcox and Allied Conditions; The Treatment of Paranoic and Paranoid States; The Prison Psychoses; Presenile, Arteriosclerotic and Senile Disorders of the Brain and Cord; The Application of Legal Measures in their Remedial Bearing; Nervous and Mental Disorders in their Military Relations; Functions of the Hospital in Nervous and Mental Disorders.

Paresis is treated in a chapter on The Treatment of the Syphilitic Diseases of the Nervous System in Volume II, in which volume the neuroses are considered.

The editors are to be congratulated upon the result of their labors and particularly upon the selection of their contributors. With rare exceptions their judgment has been confirmed by the contributions—and these constitute a valuable addition to the literature of neurology and psychiatry.

Index-Catalogue of the Library of the Surgeon General's Office, United States Army. Authors and Subjects. Second Series. Vol. XVIII. Tetamore-Tzschirner. (Washington, 1913.)

We have several times, when speaking of the appearance of a new volume of this series, commented on the value of this work to American physicians. Each year has confirmed this opinion and the present volume adds evidence to the thoroughness which enters into the making of this index. Its value is perhaps more forcibly impressed upon us just now when we learn of agitation for its discontinuance by some penny-wise person. It would be a sad blow to the advancement of American medicine to have this valuable adjunct to study and research taken away. It is encouraging to know that everywhere physicians are protesting against this proposed action, and we believe that Congress is wise enough to see the folly of passing such a bill. A protest to one's Congressman can do no harm.

W. R. D.

Obituary.

EDWARD C. SPITZKA, M. D.

Dr. Edward C. Spitzka died at his home in New York on January 13, 1914, at the age of 61 years, 2 months and 3 days. He was born in New York, being of Germano-Slavonic origin.

He was educated in the public schools and in the College of the City of New York, and received his medical degree in 1873 from the Medical Department of the University of New York. After obtaining his degree, he passed three years in Europe, studying chiefly at Leipsic and Vienna, where he devoted special attention to Embryology, Brain Morphology, Psychiatry and Diseases of the Eye and Ear; his principal teachers at the former university being Wagner, v. Coccius, His, Hagen, Wunderlich and Thiersch, and at the latter, Meynert, Politzer, Billroth, Bamberger, Brucke, Arlt and Schenk. He served as an assistant to the chair of Embryology at the University of Vienna from 1874 to 1875. He entered into general practice in his native city in 1876, occupying among other positions that of surgeon to the out-door department of Mt. Sinai Hospital and Consulting Neurologist to the North-Eastern Dispensary and St. Mark's Hospital. He obtained a considerable amount of pathological material from the private and public asylums in and near New York.

The results of the analysis of this material were embodied in an essay on the "Somatic Etiology of Insanity" which gained the prize offered by the British Medico-Psychological Association from the fund presented by W. and S. Tuke in international competition. During the same year (1876) he obtained the prize of the American Neurological Association offered by Dr. Wm. A. Hammond for an essay on Psychological Effects of Strychnia. He has occupied the positions of Professor of Comparative Anatomy in the Columbia Veterinary College; Professor of Nervous and Mental Diseases and of Medical Jurisprudence in the New York Post-Graduate Medical College (1882-87); Consulting Neurologist in Sydenham Hospital; President of the American

Neurological Society (1890); President of the New York Neurological Society (1883-4); Editor of the American Journal of Neurology and Psychiatry (1881-4); Vice President, Section of Neurology of the Ninth International Medical Congress, Washington, 1887; Chairman, Section of Somatology, Congress of Arts and Sciences, St. Louis, 1904.

He was a member of the Society of Medical Jurisprudence, New York Academy of Medicine, New York Neurological Society, American Neurological Society, Association of American Anatomists, New York Pathological Society, New York County Medical Society, and honorary fellow of the Chicago Academy of Medicine.

Dr. Spitzka's labors have been chiefly in the direction of the deep anatomy of the brain—the morbid anatomy of organic diseases of the central nervous system and the classification of mental disorders by clinical methods.

He published a text-book on "Insanity" in 1883 which has been succeeded by two editions of the same. He is the author of the articles on "Chronic Spinal Diseases" and "Cerebral Abscess" in Pepper's "System of Medicine by American Medical Authors"; also of "Brain Histology" in Wood's "Reference Handbook."

Dr. Spitzka was also a frequent contributor to medical and scientific periodicals.

For the last thirty-five years Dr. Spitzka had limited his professional work to the specialty of nervous and mental diseases. He had been frequently called as a medical witness in cases where the mental state of a prisoner in a criminal proceeding or of a testator in civil proceedings was in question, also in several well known cases of alleged spinal injury. Notable among the criminal cases was that of Charles J. Guiteau, the assassin of President Garfield, in which Dr. Spitzka testified to the prisoner's insanity.

Dr. Spitzka was married in 1875 to Catharine Wacek, in the city of Vienna. He is survived by the widow, a brother, and a son, Edward Anthony Spitzka, M. D., Director and Professor of Anatomy of the Daniel Baugh Institute of Anatomy of the Jefferson Medical College, Philadelphia.

RALPH LYMAN PARSONS, A. M., M. D.

Dr. Ralph Lyman Parsons died at his home at Ossining, N. Y., February 26, 1914. Dr. Parsons was born July 30, 1828, at Prattsburgh, Steuben Co., N. Y., and after attending the district school entered Franklin Academy at Prattsburgh where he was prepared for Amherst College from which he was graduated in 1853. He received his medical degree from the New York Medical College in 1857.

He was the Medical Superintendent of the New York City Asylum for the Insane from 1865 until 1877. He was the Medical Superintendent of the Kings County Asylum for the Insane from 1877 to 1878. In 1880 he established a private hospital for mental and nervous diseases at Ossining N. Y., known as "Greenmont on the Hudson," of which he was the Physician-in-Charge at the time of his death.

Dr. Parsons was the author of numerous papers dealing with the care and treatment of the insane.

He was a member of the New York Academy of Medicine, the New York Neurological Society, the New York State and County Medical Societies, the Society of Medical Jurisprudence, the American Medico-Psychological Association, and the American Neurological Association.

Half-Yearly Summary.

CALIFORNIA.—*Los Angeles County Hospital, Los Angeles.*—The new psychopathic ward of this hospital has been accepted by the Board of Supervisors.

COLORADO.—During December the city of Denver threatened to bring suit against the State on account of the refusal of the state hospitals to receive patients from the Denver State and County Hospital which has been much overcrowded for some time. After a conference between Mayor Perkins and Governor Ammons an agreement was reached for relief of the overcrowding.

CONNECTICUT.—*Norwich State Hospital for the Insane, Norwich.*—Present population: Male 489, female 501; total 990.

Additional buildings completed during the last six months: Two ward buildings for mildly disturbed cases, capacity 100 each; amusement hall building (containing store and baggage rooms in basement, ten offices for male and female supervisors, and central dining room for 550 patients on first floor, an amusement hall on second floor with seating capacity for 850 patients, and an ample dance hall in a mezzanine story over supervisors' offices and corridor and as a gallery over small portion of dining room); an addition to the cow barn, and a club house for employes.

The club house is a two-story brick fireproof building on the bank of the Thames River, built within an appropriation of \$10,000 made by the state legislature for this specific purpose. The first floor contains three bowling alleys, a large pool room, a store where lunches, soft drinks, candy, cigars, etc., are sold; the second floor has a gymnasium, game room, reading room, and ladies' room. Over the reading, game, and ladies' rooms and as a gallery to the gymnasium, are shower and locker rooms. Membership in the club is composed of active (male employes), associate (female employes), and honorary (members of Board of Trustees, ex-employes, etc.). The government of the club is vested entirely in a Board of Directors chosen by the active members from those who have been in the employ of the hospital not less than one year, four from ward employes and three from the other departments. The club is supported by monthly dues of twenty-five cents from active members and profits from sales.

Buildings now under construction: Two ward buildings with capacity for 100 patients each, a root cellar and vegetable room, shop building for carpenter, painter and mason, and a horse barn.

An attendants' course has been instituted and is required of every new ward employe not a graduate nurse. The following lectures are given: The Hospital, Its Organization and Management; Circulatory System,

Digestive System; Accidents and Emergencies; Bandaging; Disinfecting and Disinfectants; Medicines; Hospital Ethics; Serving of Food; Mental Diseases; Mental Nursing; Ward Hygiene. In addition weekly ward demonstrations are given by the General Head Nurse in bed making, bed baths, the taking of observations, chart and chart keeping, enemata, special baths and packs, medicinal applications and the preparation of trays, and by supervisors in hospital housekeeping, embracing the proper care of the wards, serving rooms, dining rooms, water sections and bath rooms, the serving of food, care of beds and bedding, clothing, supplies and utensils. Examinations at the end of course are optional. If passed successfully a certificate is given. The above is in addition to the nurses' training school.

A civil service law passed by the last session of the General Assembly places all officers and employes in a classified list. Appointment and promotion in the classified civil service is made by means of competitive examinations. Credit is given for length of service.

The hospital employs a field worker, Miss Catherine W. Beekley, from the Eugenics Record Office.

ILLINOIS.—The State Charities Commission has started a campaign for the prevention of mental diseases. In January, at a meeting of the State Hospitals Medical Association with the Chicago Neurological Society, a committee, composed of Drs. H. D. Singer, E. A. Foley, and Mr. A. L. Bowen, presented a report on A Practical Campaign for the Prevention of Nervous and Mental Disease. In this it is recommended that the newspapers be requested to publish facts about the Illinois State Hospitals; that there be co-operation between the press and state charities; that articles written for the laity be printed in the popular magazines; that psychiatry be made a required study in all medical colleges; that psychopathic wards be established in general hospitals; that a system of after-care be established; and that that a system of out-patient care be devised. It is also urged that such changes be made in the commitment laws as will render unnecessary the detention of the insane in jails or their being held for trial like criminals.

The State Board of Administration has decided that the new hospital for insane be located on the northeastern portion of the Kilpatrick farm, which is located one and a half miles west of Upper Alton. It is expected that the hospital will cost \$1,000,000.

—*Chester State Hospital, Menard.*—The population of this hospital is constantly increasing, and as a result, the accommodations are becoming more inadequate. A new hospital for the criminal insane is under consideration, the construction of which is being eagerly awaited.

For the above reason no appropriation has been made for gross or radical changes, improvement, or new construction to relieve the overcrowding. To meet the immediate needs, minor improvements have been necessary. The furniture on the wards, and in the employes' rooms has been renovated,

rendering both more attractive. The green-house has been repaired and improved, and hereafter it is believed will furnish green vegetables throughout the year. A new feed shed for the cow herd has been constructed, and the horse stable, which was in a dilapidated condition, has been repaired.

—*Chicago State Hospital, Chicago.*—The last six months have been active ones in this hospital. Two two-story brick cottages, accommodating 80 male patients each, have been completed and are occupied by a quiet chronic class. The tubercular patients, non-insane, have been removed from the wooden building, now part of the hospital property, the wards have been thoroughly renovated and are now occupied by insane patients, removed from the old poor house, which is soon to be torn down and replaced by a new administration building and two receiving cottages. This occupation will be temporary, pending the building of three more cottages for chronic patients. The receiving wards are badly needed and it is hoped to have them completed before the end of the year, one each for male and female patients. Besides the structures above mentioned, there will be a new power plant and a nurses' home, the total appropriations for this work amounting to over \$700,000. This means that within a year's time the institution will be quite rehabilitated, and the removal of the old main building later on will complete the transformation into a modern hospital, built entirely upon the cottage plan.

There have been many changes in the medical staff in the last three months.

Dr. Smith, Assistant Superintendent, during his brief residence in this hospital, rendered most efficient service and left behind him a multitude of friends, who in farewell, gave him a banquet at the Chicago Automobile Club, and a dance at the hospital, together with various gifts, expressive of their appreciation of his service and friendship.

In January the quarterly meeting of the State Hospitals Medical Association was held at this institution and was well attended by the Board of Administration and physicians from the various hospitals. The local society is quite active, meeting semi-monthly, and it is often addressed by well-known clinicians of the city.

One of the late innovations is music for some eight hundred patients, while at their meals, in the general dining room.

—*Cook County Detention Hospital, Chicago.*—This hospital has been dismantled to make room for a new psychopathic hospital which will accommodate over two hundred patients.

—*Watertown State Hospital, Watertown.*—On account of the crowded condition of this hospital inebriates and other non-insane patients will no longer be admitted.

Iowa.—The State Board of Control has purchased a tract of 960 acres near Woodward, which is about 19 miles northwest of Des Moines, which

will be the site of the state epileptic colony. Its cost was \$188,160. It will probably be two or three years before the colony is in operation.

—*Cherokee State Hospital, Cherokee.*—Progress on the hospital for tuberculous insane referred to in the last summary has been slow. It is hoped that it will be occupied on or about the first of June. Arrangements have been made for materially strengthening and expanding the industrial department for patients, new and additional equipment having been arranged for. Some changes in the present dining room service are being considered and will no doubt be made during the next six months. Minor repairs and improvements about the buildings and grounds are in constant progress.

KANSAS.—*Larned State Hospital, Larned.*—This new hospital was expected to be ready to receive patients about February 1.

—*State Hospital for Epileptics, Parsons.*—The population of the hospital is now about 500 with a number at home on parole. More room for male patients is a pressing need.

Extensive repairs about the power house have been completed recently.

A modern ice manufacturing and cold storage plant has been built and is giving excellent service.

An iron fence with a main entrance gateway of Carthage stone has been erected, separating the lawn from the street and adding much to the appearance of the front drive.

A building for the fire department and a modern reenforced concrete dairy barn are to be erected at an early date.

MAINE.—*Maine Insane Hospital, Augusta.*—Dr. Miller and several of his assistants have left the hospital owing to some trouble with Governor Haines, details of which have not yet reached us. Two of the county medical societies have endorsed Dr. Miller and declared the action of the governor in removing him to be unwarranted.

—*Bangor State Hospital, Bangor.*—By act of the legislature of 1913 the name of this institution was changed from Eastern Maine Insane Hospital to the Bangor State Hospital.

The legislature granted an appropriation of \$26,000 for the construction of a storehouse and cold storage plant. A building 60 by 70 feet has been erected for a storehouse, adjacent to the kitchen building. The new building is of brick and reinforced concrete construction with granite trimmings, conforming to the style of architecture of the other buildings and was built so as to form a part of a future building to be used for a congregate dining room. The old storeroom has been removed to the room formerly occupied by the bakery; other rooms formerly occupied by the bakery have been converted into cold storage rooms. The cold storage plant consists of five rooms, the largest room, 20 feet square, being used for a meat room, the

others for vegetables, butter, eggs, milk and the chef's daily supplies. An ice making unit of the capacity of 1800 pounds, twenty-four hours, has been installed. A special appropriation was also granted for the renovating and rearranging of two wards in the older buildings which are now used as receiving wards. The operating room in connection with the women's receiving ward has been enlarged and equipped. The fire protection of the hospital group has been improved by the installation of the fire main in the rear of the buildings, and the installing of three hydrants and a fire pump.

MARYLAND.—The Mental Hygiene Committee of the Maryland Psychiatric Society, of which Dr. Adolf Meyer is chairman, held a meeting on January 7, 1914, when Dr. W. B. Cornell, the executive secretary, read his report. During the year 320 cases have been cared for. The objects of the committee are the prevention of mental breakdown by early treatment, practical advice, and material assistance when necessary; after-care and reestablishment in the community of persons discharged from state hospitals; social service in co-operation with organized and private charity and the hospitals; to familiarize the public with the causes and means of prevention of mental disease, feeble-mindedness, delinquency and criminality; to do and effectuate everything possible to improve and elevate the standard of care for the mentally afflicted in Maryland. The work of the committee has grown so that additional assistance is necessary.

The committee has organized a conference to be held in Baltimore on May 25, with similar committees from Massachusetts, New York, Illinois, Connecticut, Pennsylvania and North Carolina, besides the National Committee for Mental Hygiene. Dr. Wm. H. Welch is expected to be one of the speakers on this occasion.

—*Eastern Shore State Hospital, Cambridge.*—The erection of a building to accommodate 200 patients was begun in October. This is the first of the series which has been planned. It is expected to be ready for occupancy during the summer.

—*Springfield State Hospital, Sykesville.*—The cornerstone of the new building, known as the John Hubner Psychiatric Hospital, is expected to be laid in May, with appropriate ceremonies, under the auspices of the Maryland Psychiatric Society. The construction and equipment is expected to cost \$150,000. It will be a reception hospital and will be well provided with facilities for treatment and study of mental cases.

—*Sheppard and Enoch Pratt Hospitals, Towson.*—The ice pond, which is no longer used for the production of ice since the installation of the ice plant spoken of in the last summary, is being made into a concrete reservoir for water storage.

A study of the Abderhalden reaction has been made with very interesting results which will shortly be published.

—*Edgewood Sanitarium, Govans.*—The building was so badly damaged by fire October 14 that rebuilding has been necessary. There were ten patients in the sanitarium at the time of the fire, which occurred early in the morning, and two of them were suffocated.

MASSACHUSETTS.—The State Board of Insanity has been practically reorganized, Dr. L. Vernon Briggs having been appointed chairman in place of Dr. Howard, Hon. James M. W. Hall in place of Dr. Taylor, and Mr. Roger Walcott in place of Dr. Whitmore. The executive officer, Dr. Thompson has resigned and his successor has not been appointed. The deputy executive officer, Dr. Daniel E. Fuller, has also resigned and expects to take up work in Philadelphia.

A conference on The Relation of Mental Diseases to Alcohol was held at the Boston Psychopathic Hospital on November 24, addresses being made by Drs. H. M. Adler, E. T. Eversole, A. W. Stearns, and E. E. Southard. A general discussion followed.

—*Norfolk State Hospital, Norfolk.*—On June 1, 1914, all the inebriates and drug habitues from the Foxborough State Hospital will be transferred to the Norfolk State Hospital, which will be ready for occupancy at that time.

The Foxborough State Hospital will be used exclusively for cases of insanity which will be transferred by order of the State Board of Insanity.

The Norfolk State Hospital is situated in Norfolk County, four miles from the present institution. In accordance with the recommendations of the trustees the requisites for the inebriate colonies, established on the 1004 acres of land, are as follows:

1. A colony for incipient or hopeful inebriate cases, men who offer a considerable prospect of recovery, and who are willing to cooperate in all measures put forward for their betterment.
2. Colonies for the more advanced male cases, patients who are supposedly incurable, and who are in need of custodial care.
3. A colony for refractory male cases, men who do not lend themselves to ordinary measures of treatment.
4. A colony for inebriate women; this colony at first to care only for women of the hospital type, namely, cases which are likely to be benefited by hospital treatment.

In order to permit of segregation and to allow for individualization in treatment, these colonies will be suitably situated and distributed over the large tract of land. The colonies, with the possible exception of the colony for refractory male cases, will consist of cottages containing a minimum number of 15 or a maximum number of 20 persons. These cottages will be under adequate supervision, and will be cared for largely by the patient occupants. Each cottage or habitation will be a unit.

Six cottages, two reception hospital pavilions, a power house and service buildings are now being equipped and will be ready for occupancy on June 1, 1914.

NEBRASKA.—*Hospital for Insane, Lincoln.*—During the winter an amusement hall was built that will seat about one thousand people. Beneath this on the first floor there is the industrial room for women, the art room, drug room, laboratory, and store room. In the basement there will be a carpenter shop and barber shop.

Two new buildings, one for men and one for women, are now occupied. The women being moved into the new building in December. The hydrotherapy plant in the men's infirmary has now been in operation about two months. About 50 treatments a day are administered. The hydrotherapy plant in the women's infirmary is not yet in operation. It will be in working order soon.

The old amusement hall has been converted into a laundry finishing room. The lower floor is devoted to washing. The men are employed on this floor while the women do most of the work on the floor above. The engine house was remodeled and enlarged and a new boiler put in.

The cement walks and curbing that were begun in the summer have been completed and there are now about four thousand linear feet of cement walk and twenty-five hundred feet of cement curbing.

There are 692 patients; 311 men and 381 women.

NEW YORK.—In Governor Glynn's message he dwelt upon the injustice to the state which supports nine thousand alien insane because it is the receiving station for the bulk of the foreign immigration. Bellevue and other hospitals complain because of the cost of care of aliens. Some relief from the federal government has been urged. The governor signed a bill February 19 appointing a commission to accomplish this.

A committee of the Bar Association has urged that where a defense of insanity is made in a criminal case that the verdict be rendered, "guilty, but insane," rather than the usual one of "not guilty, on the ground of insanity." It is also suggested that the defendant be sentenced to one of the hospitals for criminal insane "until such time as in the opinion of the governor on an application for pardon he may be set free with safety to the community." This proposed change is in line with the law which has been in operation for 30 years in England.

—*Binghamton State Hospital, Binghamton.*—The general plans for the new lighting plant and the addition to the laundry mentioned in the summary last fall have been completed and these greatly needed improvements will probably be made during the coming summer.

Another improvement for which arrangements are now being made, is the provision of a large workroom for educational industries, where the re-education of dementia præcox patients may be carried on under the direction of a capable teacher. In this department ornamental basket-making, embroidery, artistic rug-weaving, drawing, painting and many other allied occupations will be made use of in an effort to arrest the progress of mental decay and to awaken dormant faculties in patients of this class.

For many years past the practice of granting paroles to patients and of extending "after-care" to aid them in becoming self-sustaining, has been followed with gratifying success. This field was further extended last autumn by the establishment of an out-patient department where, under the supervision of one or more of the hospital physicians detailed for such service, patients who feel the need of advice and treatment without coming to the hospital, may have such attention from experienced medical advisers without the formality of a commitment or the need of entering the hospital as voluntary patients. This field is a large one and considerable time will be required for the completion of a systematic organization to cover it, but the results already attained give gratifying evidence of the value of the service members of the hospital staff can give to many needy persons who would otherwise be beyond the reach of such assistance.

Among the material improvements that have been made at the hospital during the past six months is a crib at the mouth of the intake-pipe in the river in connection with the water supply plant; rebuilding and extending the protection wall along the river bank where the wall was partly destroyed by water and ice last winter; the installation of track scales for weighing coal and other supplies by the car-load; additional heating surface installed at the chronic building (Broadmoor); sanitary floors in the cellars at all the farm cottages, and general renewal of the steam heating system in the North building.

A regular quarterly conference of managers and superintendents of all the state hospitals in New York State was held with the State Hospital Commission at this institution November 25, 1913. The principal topic of discussion at this conference was "Modern Methods of Heating," and a general discussion followed an address by Mr. Charles G. Armstrong, an engineering expert from New York City.

—*Buffalo State Hospital, Buffalo.*—There has been completed, during the year, a pavilion of the bungalow type, for the care of cases suffering from contagious diseases. It consists of two dormitories, surrounded on three sides by open verandas, with an extension, containing isolation rooms, baths, etc., so arranged that patients of both sexes can be accommodated there at the same time. If patients of only one sex are ill the arrangement of doors, etc., is such that the building can be thrown all into one, or a day room made of a dormitory, or complete seclusion can be obtained for different diseases. It will accommodate easily 12 patients. The foundation and cement verandas were done mostly by patient's labor. The cost was \$4000.

A pavilion for cases of tuberculosis among men has been completed with the exception of the insulation cables for electric lighting. It consists of a large dormitory or day rooms, sun rooms, bath rooms, single rooms, kitchens, etc., and is so built as to be capable of extension. It accommodates 20 patients, and the cost was in the neighborhood of \$10,500.

An ice-manufacturing plant has been installed at the hospital and the

former ice-house has been transformed into a cold storage house for the care of provisions.

A new bakery building has been built, but the ovens are not yet installed, and it is not yet occupied.

Encouraged by the excellent results obtained and the amount of pleasure given, the Board of Managers has directed renewal of a search for a farm for convalescents, preferably on the lake shore, to take the place of the very useful farm which the hospital lost by its sale to other parties.

On November 18 and 19, 1913, there was held at the hospital a conference of the assistant physicians of the State Hospitals of Central and Western New York. There were about 18 assistant physicians from other hospitals in attendance. Dr. August Hoch, Director of the Psychiatric Institute, conducted the meeting, and papers were provided by the following members of the Buffalo State Hospital: Drs. Gorrill, Kuhlmann, Armstrong, Betts, Fletcher and King. There was in attendance also some of the physicians from the City of Buffalo, especially at an evening session, when Dr. Hoch gave an illustrated lecture on the subject of aphasia.

—*Craig Colony for Epileptics, Sonyea.*—A commitment law just enacted provides for the judicial commitment to the colony of all applicants who are mentally incompetent, the admission as voluntary patients of such applicants as are competent, the authority granted the colony to secure the judicial commitment of such of its inmates as were at the colony previous to the enactment of this measure, providing such inmates are incompetent.

The autopsy law applying to the colony has also been amended so as to permit a general autopsy (in certain cases) instead of being confined to the brain.

The Colony Training School for Nurses has been accepted for registration by the New York State Education Department.

As for several years past an effort to secure appropriations for the erection of a greatly needed addition to the Peterson Hospital, the hospital building at the colony, also for two Nurses' Homes, one for each sex, has been once more unsuccessful.

Tall Chief and Seneca Cottages, two dormitory buildings occupied by male patients, have been replastered and rewired throughout, and in the latter new plumbing installed.

The contract has been awarded to substitute sand for gravel after the installation of increased underdrainage in the colony sewage filtration beds.

The erection of four employees' cottages, three for one family each, and one for four married couples employed as attendants, has been begun.

The remodeling of the dairy barn is now under way. The present wooden stanchions will be replaced by modern iron stanchions. The floor will be of cork brick, accommodations being provided for 100 cows. A new milking room, wash room, etc., will be erected adjoining the present structure.

Hog cholera, which had first shown itself at the colony in February, 1912, again appeared last fall, causing the death of over 75 pigs. Prompt immunization with anti-hog cholera serum saved the balance of the drove. In

order to prevent, if possible, a recurrence, all shoats since born have been immunized with the serum and a month later are given a dose of virus. During the coming summer the drove will be kept under observation in newly cleared land about a mile from their present location.

Plans are completed for the new boiler house, the old one to be remodeled and used as an engine room, in which a new electrical equipment will be installed of such capacity as to provide electric power both day and night—something hitherto not available.

Funds for a central heating plant and for a modern steel coal trestle to replace the wooden one condemned years ago failed of appropriation.

The addition to the colony store in which a cold storage plant will be installed has not been constructed as yet, owing to bids exceeding the appropriation available. Revised plans have been prepared so as to advertise for new proposals.

—*Gowanda State Hospital, Gowanda.*—General repairs to the farm cottage are being made, including a fire escape from the dormitory where 36 patients sleep; also a bathroom is being put in the head-farmers' apartments.

Owing to difficulties in obtaining bids, the new boilers and steam line from the power house to the residences of the staff and the superintendent have not been installed, but it is expected that bids will be procured and the installation made during the summer.

Additional alterations have been made, in accordance with the recommendation of the State Fire Marshall, for the safeguarding of patients against injury in case of fire.

Two new cement or tile silos are to be constructed to replace wooden silos which are beyond repair.

—*Hudson River State Hospital, Poughkeepsie.*—An addition to the group known as Edgewood, accommodating 40 patients and costing \$28,000, has been completed and is ready for occupancy. The rooms are light and airy and the corridors afford ample space for indoor exercise in inclement weather.

At a cost of \$12,000 additional sun rooms and other space have been provided for the Reception Hospital, the capacity of which has been increased by 14 beds. An improved system of prolonged baths has also been installed.

The sedimentation basin constructed during the year has not shown satisfactory results and is now under examination by experts of the State Board of Health and the State Architect's office.

Plans are under consideration for the conversion of an unused power house into a plant for the manufacture of all movable furniture required by the state hospitals. It is also planned to provide all doors and sash required in new construction.

—*Long Island State Hospital, Brooklyn.*—Pursuant to a special act of the legislature the City of New York entered into an agreement on March 4.

1914, to transfer the Long Island State Hospital property, which has been under lease since 1895, to the State of New York in exchange for the property occupied by the Society for the Reformation of Juvenile Delinquents, Randall's Island, N. Y., and the Sunken Meadows appurtenant thereto. Immediate steps are being taken to prepare and present the necessary deeds.

Several months ago a formal order was entered by a Justice of the Supreme Court restraining the city from constructing streets through the hospital premises.

Since the establishment in the early summer of 1912 of a colony of patients at the Creedmoor branch of the hospital, situated in the County of Queens, 13 miles from the main hospital, 34 patients have continued to permanently reside there, sufficient money having been expended to install plumbing, heating and lighting facilities in the Seventh Regiment Building.

The farm work at Creedmoor has been actively pursued, 65 acres of land being under cultivation. The produce raised has lessened, to a material extent, the need of purchasing supplies in the open market.

The Creedmoor property was formerly the State Rifle Range, and was acquired for state hospital purposes by an act of the legislature in 1908.

Besides the out-patient department at the main hospital, a similar department called the mental hygiene clinic was formally established at the Long Island College Hospital July last. The need of a mental clinic in conjunction with a regularly established out-patient department in the congested, as well as more accessible portion of the Borough of Brooklyn, is warranted by the results shown during the brief period of its existence.

Plans are being drawn for a new power plant at the main hospital, for which the sum of \$125,000 has been appropriated for construction. Also, plans have been made for a new store house and cold storage building, the construction of which will cost \$30,000.

Funds have also been allowed for an electro-therapeutic outfit. Water taps and arc lights have been installed on the lawns. The roof of the main building of the hospital has been repaired. All water sections and stair wells on the wards have been rehabilitated. Steel ceilings have been installed and the building generally rewired, the former electric wiring having been found unsafe.

Funds have been allowed for the employment of a social worker, whose duties will pertain to prevention and after-care work in the Borough of Brooklyn.

The certified capacity of the institution is men 340, women 297, total 637; the capacity was increased by 12 by the removal of the sewing room from the women's wards. At the present time the institution is 34 per cent overcrowded.

The annual admissions to the hospital are about 550, a very large number of whom are of the delirious, exhaustive type, and require the maximum amount of nursing.

The daily average number of patients on parole is 33.

On February 27 the following managers were appointed: Mr. Henry R. Chittick, to succeed Mr. Richard W. Bainbridge, resigned; Mr. Charles Partridge, to succeed Mr. James McMahon, deceased; George E. Brower, to succeed Hon. Alexander E. Orr, resigned. Mr. Michael F. McGoldrick, was re-appointed.

The class in arts and crafts continues an important therapeutic feature, and is in charge of those specially trained to give instruction to patients. As a result of fairs held, this department is entirely self-supporting so far as the outlay for materials is concerned.

—*Manhattan State Hospital, Wards Island.*—The following is a list of improvements made during the past six months:

Completed the installation of new locks throughout the institution, the concreting of the East Dock, installation of new boiler in the steamer "Wm. L. Parkhurst," and the roofs of the root cellar, and Camp K have been replaced with Paroid roofing.

Workmen are now installing cold storage rooms in kitchens 1, 2 and 3, and also in the Staff House.

The following are under contemplation: New nurses' home, fire alarm system and additional accommodation for men and women patients.

—*Mohansic State Hospital, Yorktown.*—No new buildings have been constructed on the site of the Mohansic State Hospital which was established by an act of the legislature in 1910, but in June of that year 12 patients were transferred from other hospitals to one of the farm houses. Of the five farm houses on the place, three have been fitted up for patients, and the census at this writing is 64 patients.

The railroad spur from Yorktown Heights has been completed onto and through the hospital grounds. The construction work of the hospital has been held in abeyance because of difficulties in constructing a proper sewage disposal plant. The matter, however, has been practically settled and it is expected to begin construction work at an early date.

This institution, according to plans all ready made will accommodate 3000 patients, with a possible extension to accommodate 4000.

The patients on the place at this time assist in caring for the farm houses; in doing garden work and general farm work. The farm products last year amounted to more than \$10,000 in value.

—*Rochester State Hospital, Rochester.*—The additions to the Lake Farm buildings are nearing completion. The construction of an additional nurses' home is well under way.

—*St. Lawrence State Hospital, Ogdensburg.*—There has been constructed a propagating house for vegetables at the Garden Cottage. Two continuous baths have been installed in the Flower Building; also additional plumbing in the Employees' Cottage, giving more facilities for bathing and more privacy.

Work is in progress at the power plant replacing the old boilers with new ones of increased capacity. This will allow several independent heating stations throughout the institution to be discontinued, and will result in a saving through less coal consumption and a reduction of the force of employes.

—*Willard State Hospital, Willard.*—Arrangements have been made for the transfer of 75 patients (50 men and 25 women) from the Manhattan State Hospital.

The hospital has been unusually free from acute and infectious diseases, notwithstanding the prolonged and severe winter weather. Smallpox is prevalent in 16 different communities in the state, and the State Health Commissioner has advised, in conjunction with the State Hospital Commission, that both patients and employes be vaccinated, which is being done at this writing.

An addition to the laundry was completed a few months ago and is now in use as a sorting room.

NORTH CAROLINA.—A Conference on Mental Hygiene was held at Raleigh, November 28 to December 2. As a result of this the North Carolina Society for Mental Hygiene was organized with a provisional executive committee composed of Dr. John McCampbell, of the Morgantown State Hospital, Dr. Wm. W. Faison, Superintendent of the Goldsboro State Hospital, and Dr. Albert Anderson, Superintendent of the Raleigh State Hospital, Dr. Anderson being Secretary. Later, an election of officers was held, Dr. Anderson being elected Secretary and his place on the committee being taken by Mr. Clarence Poe, of Raleigh.

—*State Hospital, Goldsboro.*—Fire in this hospital, on February 21, destroyed property valued at \$6000.

—*State Hospital, Morgantown.*—The new building which is under construction is expected to be ready for patients early in the summer.

NORTH DAKOTA.—*State Hospital for the Insane, Jamestown.*—In January there were 12 cases of smallpox in this hospital. Prompt measures prevented any further spread of the disease. It is the fifth time since the opening of the institution that smallpox has appeared.

OHIO.—On March 12 a society was organized at Dayton to be known as Friends of the Insane, which has for its object the betterment of the insane.

—*Massillon State Hospital, Massillon.*—Probably the most important improvement in the past year was the erection of a building for educational and diversional purposes. A philanthropic friend of the institution donated enough money to buy the material, and with the aid of the patients' labor there was constructed a building worth at least \$40,000. It is two stories high with a high basement on three sides. In the basement are billiard and

pool tables, bowling alleys, two toilet rooms and three shower baths. On the ground floor, which is but slightly above the level of the street, are two large rooms, each 21 x 45 feet. One is used for a school room and the other as a library and reading room. The school room is fitted up to resemble an old-fashioned country school with maps and blackboards on the walls. There is a raised rostrum for the teacher. The library contains about 500 volumes for the use of the patients. There are also a number of daily papers, magazines, etc. The room is well fitted up with chairs, tables and games of all sorts and is well lighted. The third floor is 45 x 60 feet. This room is used for gymnasium, calisthenic and drill work. There are two pianos in the building, one in the drill room and one in the school room. The entire equipment of the building was purchased out of this donation fund. A school building for the exclusive purpose of education and diversion is rather unusual in a hospital of this kind. The school has been in session for about six months and the attendance averages more than 100 pupils per day. It was organized by and is in charge of Prof. Charles Hutt. After two or three months it was found that the work was more than could be accomplished by one teacher, and on the first of January Miss Zur-Linden was appointed assistant, with special charge of the calisthenic and drill work. Three sessions are held daily. The exercises consist of songs by the school, special piano numbers, followed by the reading of a story or a talk on some topic of special interest. There are regular classes in reading, spelling, oral arithmetic, geography, history, free-hand drawing and German. Not all the pupils attend all these classes, but enough are interested in each subject to form a class. The reading lessons are enlarged by oral discussion and language work, and the pupils are encouraged as far as possible to tell their experiences and opinions. The problems in arithmetic deal with things that appeal directly to the pupils' interests, and always receive a ready response. All of the work is made to move quickly and is varied as much as possible, since the pupils have not the same capacity for sustained attention and routine work as normal pupils. Drawing appeals to the majority, and those who cannot do the work like to watch. The Perry pictures and colored nature pictures are a valuable help. Blackboard drawings are also used to illustrate things of interest, such as the seasonal return of birds and flowers. As yet it is too early to predict with definiteness the results which have been very encouraging so far.

—*The Cincinnati Sanitarium, Cincinnati.*—During the past year a series of cases of paresis and taboparesis have been treated by the "intensive" administration of neosalvarsan, repeated at short intervals, until the blood reacted negatively to the Wassermann test.

The results of these observations to date have appeared in *The Lancet-Clinic* for March 14, 1914.

The administration of lecithin and of sodium nucleinate, by the hypodermatic method, has also been instituted with apparently more satisfactory results than the method of giving these substances by mouth.

Recent additions to the acute wing of the main building provide six new baths for hydrotherapy, as well as 11 new rooms for patients and larger hall capacity for indoor recreation.

Looms for hand-weaving have also been provided for suitable patients with much satisfaction to them.

OKLAHOMA.—*State Hospital for the Insane, Supply.*—On November 3 fire destroyed a building causing a loss of \$25,000. No lives were lost. The trustees have decided to erect a modern fireproof hospital to replace it.

PENNSYLVANIA.—*State Hospital for the Insane, Norristown.*—A Hydrotherapy Building has been completed and the apparatus installed, which is being used daily by a trained operator. This has been a great addition to treatment.

The office building for the resident physicians has been completed and occupied, the first floor being taken up with offices for the physicians and the second floor for a medical library.

During the past year the overcrowding of the institution has been so marked that on December 13, 1913, the Board of Trustees passed a resolution to refuse further admissions on account of the danger to those already detained in the hospital. Legal steps were taken to force the hospital authorities to receive patients, but the court sustained the Trustees in the policy they had adopted. On February 18, 1914, the overcrowding had been somewhat relieved by transfers and parole of patients so that admissions were again received.

Diversional occupation continues to play a prominent part in treatment. During the coming year an attempt will be made to raise broom corn and make brooms for use in the institution in addition to other industries already carried out.

—*Philadelphia General Hospital, Psychopathic Ward, Philadelphia.*—Hereafter all patients will be received for 30 days observation, after which they may be transferred for further care to the State Hospital for the Insane at Norristown.

—*Pennsylvania Epileptic Hospital and Colony Farm, Oakbourne.*—By the will of Mrs Anna F. Francine this hospital has received a contingent bequest of two-thirds of \$130,000, the University Hospital receiving the other third.

SOUTH CAROLINA.—*State Hospitals for the Insane, Columbia.*—During 1907-13 over 900 patients were received suffering from pellagra, and during the past year 165 patients died as a result of the disease.

SOUTH DAKOTA.—*Asylum for Insane Indians, Canton.*—The old wooden water tank of 6600 gallons capacity has been replaced with an all steel tank of 30,000 gallons capacity on an 80 foot tower, giving an ample water sup-

ply and sufficient pressure for fire fighting. Work on the hospital building was discontinued in December and has not yet been resumed, though it probably will be in a week.

TEXAS.—*Southwestern Insane Asylum, San Antonio.*—Plans have been made for a woman's hospital building which is to cost \$50,000.

—*State Lunatic Asylum, Austin.*—There is under construction a new building which will accommodate about 50 patients and which will be used as a home for the old lady patients of the institution. These patients will be removed from the wards and cared for in a separate home where they will have more liberty and more home like surroundings.

A hospital including a department for tuberculous cases for the negro women of the institution will soon be erected.

VIRGINIA.—One of the new laws enacted by the Virginia legislature this winter provides for the voluntary admission to state hospitals of persons in the early stages of mental disorder, or those on the border-line of insanity. Under this law citizens of the state may, without undergoing the usual and often objectionable legal process of a commitment by a judge or a justice and two physicians, enter a state hospital just as he would a general hospital, and receive needed special treatment, at a nominal cost, if able, otherwise without cost. Another new law has for its object the immediate admission into a state hospital of acutely or violently insane persons who are in urgent need of hospital care and treatment. Such cases may be admitted and detained temporarily, on the certificate of two physicians, pending a regular commitment by order of a judge or justice. The objects of this law are to provide needed hospital care and special treatment for very acute cases at the earliest possible moment, and to obviate confining such persons in jail. The next progressive step will doubtless be to have all insane persons placed under the supervision of boards of health, while their mental condition is being investigated or while waiting to be transferred to a hospital, instead of placing them in jail under penal control, as is now sometimes done. Few cases, however, are placed in jail, most cases being taken promptly to the hospital by nurses sent from the institutions.

Another important measure was one giving the State Board of Charities and Corrections authority to employ experts to aid the board in investigations of feeble-mindedness in the state, its prevalence, apparent causes, and report to the next legislature a comprehensive and practical scheme for its prevention, etc., and a plan of care and training of the several grades of mental deficients.

These laws and others passed in recent years, which established the State Colony for Epileptics and the department there for feeble-minded women, and departments at the Southwestern and the Central State Hospital for the safe and separate custody of the criminal insane, or the care therein for study and observation of persons charged with crime and suspected of being

insane, indicate a scientific and humane spirit in dealing with the insane, the feeble-minded, and the epileptics of the state.

In the matter of maintenance for the four state hospitals for the insane and the colony for epileptics, for the next two years, the legislature appropriated the sum of \$1,147,660, and for additional accommodations for patients, and for sundry improvements, insurance, etc., the sum of \$142,525; total, \$1,290,185. There are under care in the five institutions 4853 patients, about 500 being on furlough. No insane are confined in jails or almshouses.

—*Central State Hospital, Petersburg.*—There are now in the hospital 1600 patients. Though the institution is overcrowded, no patients have been allowed to remain in jails or almshouses. The legislature has appropriated nearly \$70,000 for permanent improvements, additions, etc., and increased the annuity support for next year to \$170,000.

A wing has been added to the building for the criminal insane, increasing the capacity of that department to 50.

A new psychopathic building for men is nearly completed. It is designed especially to care for about 80 recently admitted cases. When completed this building will cost only about \$18,000. The first or basement floor will be used for a diet kitchen, dining room, washroom, etc. The two upper floors will be used for sleeping and day-rooms for patients. An examination room is located on the top floor. In 1904 a similar building was constructed for the acute women patients. Both of these buildings are constructed of red brick, with gray granite and gray brick trimming. Ample porches with southern exposure are provided. The bath and toilet floors are made of reinforced concrete and terrazzo finish, etc. A wing to accommodate 10 additional patients, bath-room, new plumbing, and other improvements have been made at one of the farm colonies.

New and commodious stables and vehicle barns, a new silo, etc., have been constructed.

An adjoining farm of 77 acres has been purchased, this increasing the farm of the hospital to nearly 600 acres.

During the summer work will be begun on the construction of buildings to accommodate about 200 patients. Work on a more commodious water supply system will also be begun very soon.

A new sewerage disposal plant, by which all the sewage of the main hospital group is conveyed to the Appomattox River, a mile away. Having to carry the pipe under a car track and a branch, the inverted syphon system was used, and has proven satisfactory.

The entire heating system has been changed, enlarged and made efficient, the Webster Hylo-vacuum system of steam circulation having been installed.

The main kitchen has been made a third larger, reinforced concrete floors constructed, and almost new and modern equipment installed.

Authority was given the hospital board to establish on the farm of the hospital a colony for the colored feeble-minded. The bill providing for the establishment of such a colony does not carry an appropriation, consequently no building will yet be constructed. Plans, cost of construction, and

operation of the colony will be submitted to the next legislature, when sufficient appropriation will probably be provided.

WISCONSIN.—*Milwaukee Hospital for the Insane, Wauwatosa.*—The inebriate ward has been opened and will care for habitual drunkards who have heretofore been sentenced to the House of Correction for short periods.

CANADA.—ONTARIO.—*Hospital for the Insane, Brockville.*—The work on the new admission hospital is approaching completion so far as the exterior is concerned.

This building when finished will be a credit to the government and will give facilities for the most advanced and modern treatment in cases of mental and nervous diseases. It will put this hospital in the forefront in this province. It is hoped to have this building ready for the admission of patients in the early fall as the interior work is being rapidly advanced.

A new residence for patients is in course of erection at the new farm. This will give accommodation to 30 patients and will greatly add to the convenience of managing the farm.

The first week in January a new department was opened here in reeducational work. The Superintendent of the St. Lawrence State Hospital kindly offered to give instruction to one of the nurses in this work. She took a course there last fall and is now busily engaged in carrying on the work here. It is believed that this treatment will greatly improve a certain class of dementia præcox cases.

Appointments, Resignations, Etc.

- ALTVATER, DR. EDWARD G., Pathologist at Spring Grove State Hospital at Catonsville, Md., appointed Assistant Quarantine Physician at Baltimore, Md.
- ARTHUR, DR. DANIEL H., Superintendent of Gowanda State Hospital at Gowanda, N. Y., resigned March 12, 1914.
- ATHERTON, DR. CLESSON C., appointed Assistant Superintendent at Watertown State Hospital at Watertown, Ill.
- BARNES, DR. EDMUND J., Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., granted a six months' leave of absence to assist in the Psychopathic Ward of Bellevue Hospital.
- BAXTER, DR. ALICE, Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., promoted to Senior Assistant Physician, March 10, 1914.
- BLACKMAN, DR. MARION E., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., February 4, 1914, and resigned March 2, 1914.
- BLODGETT, DR. HARRY L., formerly Medical Interne at Hudson River State Hospital at Poughkeepsie, N. Y., and recently in private practice at Saranac Lake, died March, 1914, of tuberculosis.
- BOND, DR. EARL D., Assistant Physician at McLean Hospital at Waverley, Mass., appointed Assistant Physician at Pennsylvania Hospital at Philadelphia, Pa.
- BORDEN, DR. PARKER G., appointed Medical Interne at Buffalo State Hospital at Buffalo, N. Y., March 17, 1913.
- CHEWNEY, DR. CLARENCE O., Assistant Physician and Pathologist at Psychiatric Institute at Wards Island, N. Y., transferred to Manhattan State Hospital at Wards Island, N. Y., October 1, 1913.
- COHN, DR. EUGEN, Assistant Superintendent of Peoria State Hospital at Peoria, Ill., transferred to Kankakee State Hospital at Kankakee, Ill., March 1, 1914.
- COOLEY, DR. ELIAS E., appointed Medical Interne at St. Lawrence State Hospital at Ogdensburg, N. Y., January 14, 1914.
- COYLE, DR. WILLIAM E., Medical Interne at Government Hospital for the Insane at Washington, D. C., resigned October 18, 1913.
- CRAIGHEAD, DR. NANCY B., Woman Physician at Craig Colony for Epileptics at Sonyea, N. Y., resigned March 28, 1914.
- DAVIS, DR. R. L., appointed Third Assistant Physician at State Lunatic Asylum at Austin, Texas, December 15, 1913.
- DAVIS, DR. THOMAS K., Medical Interne at Manhattan State Hospital at Wards Island, N. Y., resigned December 31, 1913.
- DENNY, DR. THOMAS J., appointed Resident Dentist at Chicago State Hospital at Chicago, Ill., January, 1914.
- DE WITT, DR. GRACE, Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned January 15, 1914.
- DREWRY, DR. W. F., appointed to assist the State Board of Charities and Correction in an investigation of the feeble-minded in Virginia.
- DYER, DR. WILSON K., Assistant Physician at Watertown State Hospital at Watertown, Ill., resigned and has entered private practice.
- EARLEY, DR. CLARA B., Assistant Physician at Mt. Pleasant State Hospital at Mt. Pleasant, Iowa, appointed Assistant Physician at St. Peter State Hospital at St. Peter, Minn.
- ECKHARDT, DR. J. C., appointed Fourth Assistant Physician at Central State Hospital at Petersburg, Va., December, 1913.
- FARRIS, DR. GEORGE KNAPP, appointed Superintendent of Chester State Hospital at Menard, Ill.

- FISHER, DR. AMOS T., appointed Assistant Physician at State Hospital No. 2, at St. Joseph, Mo.
- FLEMING, DR. MARGARET, Assistant Physician at St. Peter State Hospital at St. Peter, Minn., appointed Assistant Physician at Independence State Hospital at Independence, Iowa.
- FRANCISCO, DR. HOWARD M., appointed Assistant Physician and Pathologist at Cleveland State Hospital at Cleveland, Ohio.
- FREEMMEL, DR. I. E., Assistant Physician at Chicago State Hospital at Chicago, Ill., appointed Assistant Superintendent at Chester State Hospital at Menard, Ill., January, 1914.
- FULLER, DR. DANIEL E., Deputy Executive Officer of Massachusetts State Board of Insanity, appointed Assistant Physician at Pennsylvania Hospital at Philadelphia, Pa., February, 1914.
- GAHAGAN, DR. HENRY J., Superintendent of Peoria State Hospital at Peoria, Ill., transferred to Elgin State Hospital at Elgin, Ill.
- GARVIN, DR. WILLIAM C., Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., granted a six months' leave of absence for travel and study in Europe.
- GRAU, DR. LEROY C., appointed Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., December 3, 1913.
- GROOM, DR. WIRT C., Medical Interne at Willard State Hospital at Willard, N. Y., promoted to Assistant Physician, March 16, 1914.
- GROUND, DR. H. T., appointed Assistant Physician at St. Peter State Hospital, Minn.
- HASKELL, DR. PEARL T., Assistant Physician at New Hampshire State Hospital at Concord, appointed Assistant Superintendent of Bangor State Hospital at Bangor, Me.
- HAWK, DR. BENJAMIN F., appointed Superintendent of Larned State Hospital at Larned, Kansas.
- HAWKINS, DR. WILLIAM H., appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., January 1, 1914.
- HAWLEY, DR. MAX C., Assistant Superintendent of Watertown State Hospital at Watertown, Ill., transferred to Elgin State Hospital at Elgin, Ill.
- HERCIK, DR. W. L., Assistant Physician at Chester State Hospital at Menard, Ill., resigned and has entered private practice.
- HILL, DR. CHARLES IRWIN, formerly Assistant Physician and Pathologist at Springfield State Hospital at Sykesville, Md., died at his home in Baltimore, Md., February 24, 1914, aged 35.
- HINTON, DR. RALPH T., Superintendent of Elgin State Hospital at Elgin, Ill., transferred to Peoria State Hospital at Peoria, Ill., February 9, 1914.
- HOWELL, DR. WILLIAM L., Medical Interne at Rochester State Hospital at Rochester, N. Y., transferred to Buffalo State Hospital at Buffalo, N. Y., July 1, 1913.
- HUDDLESON, DR. JAMES H., appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., October 1, 1913.
- JOHNSON, DR. L. S., Assistant Physician at State Lunatic Asylum at Austin, Texas, resigned January 15, 1914.
- JONES, DR. WILLIAM J., appointed Medical Interne at Mohansic State Hospital at Yorktown, N. Y., July 1, 1913.
- KNIGHT, DR. ARTHUR C., Superintendent of Montana State Hospital for the Insane at Warm Springs, resigned.
- LAMBERT, DR. CHARLES I., Pathologist at Manhattan State Hospital at Wards Island, N. Y., resigned October 1, 1913.
- LANE, DR. ARTHUR G., Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., promoted to Senior Assistant Physician, March 10, 1914.
- LIND, DR. JOHN E., Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to Junior Assistant Physician, February 1, 1914.
- LITTLE, DR. TERTIA CLAIRE WILTON, formerly Assistant Physician at Taunton State Hospital at Taunton, Mass., died in the Woman's Hospital, New York City, October 25, 1913, after a surgical operation.
- LOUE, DR. L. J., Third Assistant Physician at State Lunatic Asylum at Austin, Texas, resigned December 15, 1913.

- MACDOWELL, DR. EDITH A., Medical Interne at Government Hospital for the Insane at Washington, D. C., resigned December 26, 1913.
- MCCARTHY, DR. H. F., Assistant Physician at Elgin State Hospital at Elgin, Ill., transferred to Chicago State Hospital at Chicago, Ill., December, 1913.
- MCCARTHY, DR. R. R., Assistant Physician at Elgin State Hospital at Elgin, Ill., transferred to Chicago State Hospital at Chicago, Ill., December, 1913.
- MCDONELL, DR. JOHN F., appointed Medical Interne at Willard State Hospital at Willard, N. Y., November 17, 1913.
- MCDONNELL, DR. WILLIAM, Medical Interne at Manhattan State Hospital at Wards Island, N. Y., resigned March 12, 1914.
- MANOUGIAN, DR. K. M., Assistant Physician at Chicago State Hospital at Chicago, Ill., transferred to the Psychopathic Institute to act as Clinical Pathologist, January, 1914.
- MARTIN, MISS HELEN E., PH. B., appointed Research Assistant at Kings Park State Hospital at Kings Park, N. Y., February 8, 1914.
- MILLER, DR. C. ROSS, Assistant Physician at Ray Brook Sanitarium transferred to St. Lawrence State Hospital at Ogdensburg, N. Y., November 6, 1913.
- MILLER, DR. C. R., appointed Assistant Physician at State Lunatic Asylum at Austin, Texas, January 13, 1914.
- MURPHY, DR. JOHN P. H., Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to Junior Assistant Physician, February 1, 1914.
- NORRIS, DR. FRANK PARSONS, formerly Alienist to State Board of Administration of Illinois has purchased Maplewood Sanitarium which he established in 1901.
- NORRIS, DR. LESTER F., Assistant Physician at Taunton State Hospital at Taunton, Mass., appointed Assistant Physician at Bangor State Hospital at Bangor, Me., October, 1913.
- NORTH, DR. EMERSON A., formerly Assistant Superintendent of Longview Hospital at Cincinnati, Ohio, appointed Resident Physician at The Cincinnati Sanitarium.
- O'NEIL, DR. D. G., Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to Junior Assistant Physician, February 1, 1914.
- OOSTERBECK, DR. JOHANNES G., formerly Assistant Physician at Peoria State Hospital at Peoria, Ill., died in Chicago, January 8, 1914, aged 37.
- PARSONS, DR. RALPH LYMAN, Superintendent of New York City Asylum for the Insane from 1865 to 1877, recently in charge of his private sanitarium at Ossining, N. Y., died February 26, 1914, aged 85.
- PHILLIPS, DR. ARTHUR M., Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., promoted to Senior Assistant Physician, February 10, 1914.
- POATE, DR. ERNEST M., Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., promoted to Senior Assistant Physician, February 10, 1914.
- POTTER, DR. C. A., First Assistant Physician at Gowanda State Hospital at Gowanda, N. Y., appointed Acting Superintendent.
- PRITCHARD, DR. J. ALBERT, Senior Assistant Physician at Willard State Hospital at Willard, N. Y., transferred to St. Lawrence State Hospital at Ogdensburg, N. Y., October 20, 1913.
- READ, DR. C. F., Assistant Superintendent at Kankakee State Hospital at Kankakee, Ill., transferred to Chicago State Hospital at Chicago, Ill., March, 1914.
- REEVE, DR. GEORGE H., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., Sept. 28, 1913, and resigned March 2, 1914.
- RIACH, DR. T. J., Assistant Physician at Chicago State Hospital at Chicago, Ill., transferred to Kankakee State Hospital at Kankakee, Ill., December, 1913.
- ROGERS, DR. C. B., Resident Physician at The Cincinnati Sanitarium, appointed Resident Physician at Fair Oaks Villa at Cuyahoga Falls, Ohio.
- ROSS, DR. JOHN R., Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., appointed First Assistant Physician at Dannemora State Hospital at Dannemora, N. Y.
- RUSSELL, DR. CLARENCE L., Assistant Physician at Matteawan State Hospital at Matteawan, N. Y., transferred to Hudson River State Hospital at Poughkeepsie, N. Y.
- SCANLAND, DR. J. M., formerly Superintendent of Montana State Hospital for the Insane at Warm Springs, reappointed.

- SCHENKELBERGER, DR. FREDERICK P., Assistant Physician at Gowanda State Hospital at Gowanda, N. Y., spent the month of March, 1914, in taking a special course in neurology at the Neurological Institute in New York City.
- SEMPLE, DR. J. M., Superintendent of Eastern Washington Hospital for the Insane at Medical Lake, resigned November 9, 1913.
- SHOCKLEY, DR. FRANCIS M., Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to Junior Assistant Physician, February 1, 1914.
- SICARD, DR. CLARENCE L., Assistant Physician at Hudson River State Hospital at Poughkeepsie, N. Y., resigned and has entered private practice.
- SEVERSKY, DR. ABRAHAM, appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., January 1, 1914.
- SMITH, DR. H. J., Assistant Superintendent at Chicago State Hospital at Chicago, Ill., transferred to Peoria State Hospital at Peoria, Ill., March, 1914.
- SMITHSON, DR. WILLIAM W., appointed Superintendent of Mississippi Insane Hospital at Jackson.
- SPANGLER, DR. F. E., Assistant Physician at Chicago State Hospital at Chicago, Ill., transferred to Elgin State Hospital at Elgin, Ill., December, 1913.
- SRODES, JAMES LEWIS, Superintendent of Allegheny County Home and Hospital for the Insane at Woodville, Pa., died September 26, 1913, aged 51.
- THOMPSON, DR. CHARLES E., Secretary and Executive Officer of Massachusetts State Board of Insanity, resigned.
- TIEITZE, DR. SAMUEL, Assistant Physician at Kings Park State Hospital at Kings Park, N. Y., resigned January 13, 1914.
- TODD, DR. WALLACE S., Medical Interne at Hudson River State Hospital at Poughkeepsie, N. Y., resigned and has entered private practice at Slingerlands.
- TYSON, DR. FOREST C., Assistant Physician at Bangor State Hospital at Bangor, Me., appointed Acting Superintendent of Augusta State Hospital at Augusta, Me., January, 1914, and appointed Superintendent, March, 1914.
- VANBUREN, DR. J. H., appointed Junior Assistant Physician at Craig Colony for Epileptics at Sonyea, N. Y., October 13, 1913.
- WALLACE, DR. FRANK C., Assistant Physician at State Hospital No. 2 at St. Joseph, Mo., appointed City Physician of Maryville.
- WENDER, DR. LOUIS, Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to Junior Assistant Physician, February 1, 1914.
- WHITE, DR. M. J. formerly Superintendent of Milwaukee Hospital for the Insane at Wauwatosa, Wis., reappointed.
- WILSON, DR. ANITA, appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., February 15, 1914.
- WILSON, DR. ROBERT P. C., appointed Superintendent of State Colony for the Feeble-Minded at Marshall, Mo.
- ZELLER, DR. GEORGE A., Superintendent of Peoria State Hospital at Peoria, Ill., appointed Alienist of the State Board of Administration.

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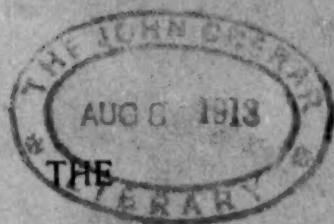
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THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION

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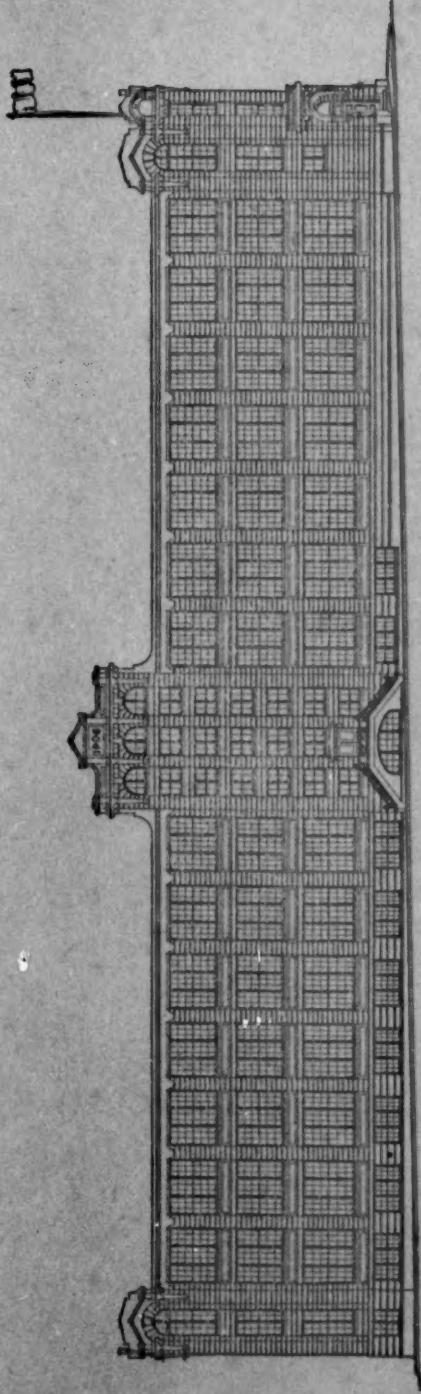
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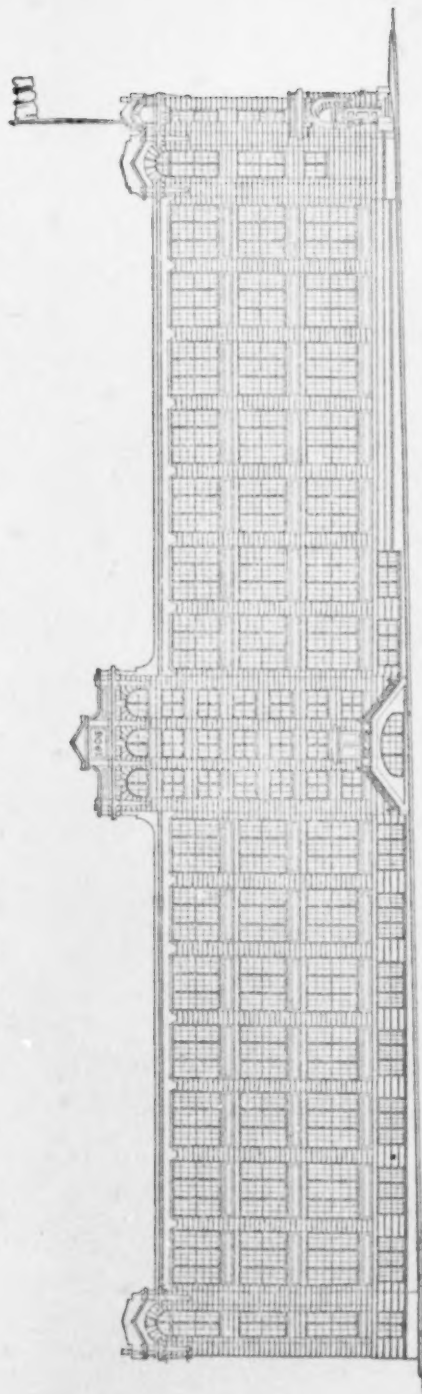
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